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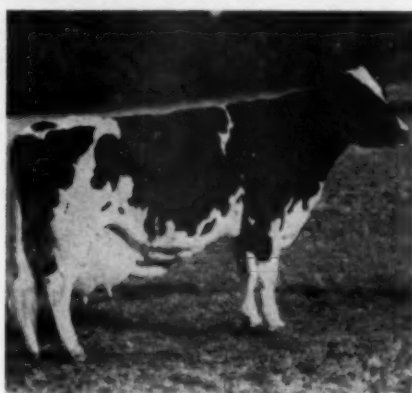
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The Physiological and Pathological Significance of the Duration of Gestation in the Mare

J. W. BRITTON, D.V.M., and C. E. HOWELL

Davis, California

APPARENTLY, the physiological duration of gestation in the mare is not satisfactorily established. Estimates of a normal range of from 307 to 394 days have been made (Saint Cyr¹), while others confine the normal range to 334 to 337 days.² Much of the confusion has undoubtedly arisen from lack of an adequate definition of physiological gestation. Some consider survival of the mare and foal at birth as adequate proof of physiological pregnancy, while others, notably Williams² and Von Oettingen,³ would consider such factors as the future breeding and economic worth of the offspring, disease appearing in the first month of postnatal life, genital disease in the mare, and rate of conception as influencing the normal duration of pregnancy. Williams,² who has written most extensively and authentically on the subject, considers prolonged gestation in the mare as analogous to premature birth in the cow, and the farther the gestation period extends from a normal average of 334 days, the greater the tendency toward dead or diseased foals, metritis, retained placenta, temporary or permanent sterility, and lessened economic worth of the foal in later years. There is,

then, according to Williams, a gradual shift from the physiological to the pathological duration of pregnancy, the limits and causes of which are not known. Premature births, except for abortions, are rare in the mare, and the greater significance has been placed on prolonged gestation. Undoubtedly, environmental and disease factors and possible hereditary factors influence the length of gestation.

The University of California's Arabian Horse Ranch at Pomona offers an excellent situation for a study of the duration of pregnancy in the mare. The year-long temperate climate and lack of a definite breeding season for Arabians enables mares to be bred so as to foal every month of the year.

An opportunity was afforded to compare the breeding records of 36 Arabian mares from 1933 to 1942 with the breeding records of 49 grade Belgian and Shire mares at Rio Vista, in central California, from 1917 to 1921, as well as 5 Thoroughbred and 10 Percheron mares at the University Farm, Davis, Calif., from 1937 to 1942, both herds having a breeding season from February to June. A summary of the breeding records of the three herds appears in table 1.

In the fall of 1917, nearly all of the Rio Vista mares were sick and 2 died of an infectious respiratory disease, probably influenza. With this exception, there were no

Contribution from the University of California Arabian Horse Ranch. J. W. Britton, Division of Veterinary Science, University of California, Davis; C. E. Howell, manager, University of California Arabian Horse Ranch, Pomona.

serious outbreaks of disease in the breeding stock of the three herds.

ENVIRONMENTAL FACTORS INFLUENCING THE GESTATION PERIOD

It has been repeatedly suggested that climatic conditions, feed, and management exert an influence on the physiological duration of pregnancy. Twenty-eight of the Arabian mares were on native pasture all year, except for a few days before and after foaling when they were stabled. Eight were either stabled or confined in small corrals close to the barn and fed hay and grain with some pasture in the winter and spring. These 8 mares produced 34 foals with an average gestation period of 330 days, as compared with an average gestation period of 337 days for the 139

TABLE 1.—Summary of Breeding Records of the Three Herds

NO. OF	ARABIANS	RIO VISTA	THOR- OUGH- BREDS*	PERCHE- RONS*
Mares	36	49	5	10
Stallions	6	1	3	2
Breeding years...	214	157	16	20
Conceptions	173	120	15	17
Services	614	356	53	49
Services per conception...	3.5	3	3.5	2.2
Live foals	157	101	13	13
Dead foals	15	13	1	3
Abortions	1	6	1	1
Average days of pregnancy....	336	343.9	339	336
Live foaling (percentage) ..	73%	64%	80%	65%

*University of California Thoroughbreds and Percherons.

foals produced by the 28 pastured mares. Obviously, the stabled group was better fed the greatest part of the year since the pastures were unimproved and were dry much of the summer and fall. The Rio Vista mares were pastured all year, and the Davis mares were pastured from June to November, then stabled and fed hay and grain from December to May. It hardly seems plausible to accept the influence of feed as the cause of the greatly increased duration of pregnancy in the Rio Vista mares.

Climatic conditions do not vary greatly in any of the three localities, although, if anything, it is milder in Pomona where the Arabians are maintained.

A factor apparently influencing the gestation period is the month of foaling. Whether this is physiological, due to irregular estrual cycles, environmental, due to increased or decreased nutritive condition of the grass at certain stages of gestation, or pathological is not known. Probably, it is a combination of environmental and physiological factors. The effect of the month of foaling on the gestation period is shown in table 2. The Arabians, which foal every month of the year, are best suited to show this difference and are the only ones included in the table.

The rather sharp drop in the average length of the gestation period from the winter and spring foalings to the summer and fall foalings is also illustrated in the Rio Vista mares, which averaged 342 days for February foalings, 340 for March, 349 for April, 342 for May, and then dropped to 331 and 327 days for the June and July foalings.

The most logical explanation for the prolonged gestation period of mares foaling in the winter and early spring appears to be the decreased vigor of the mare as a result of decreased nutritive value of the feed at the period of the year when the mare is four to six months pregnant. It is believed that the fetus normally attains its most rapid degree of growth during the last half of pregnancy. Consequently, the reduced vigor of the pregnant mares during the dry, hot, summer and fall months is reflected in a longer normal gestation period than those mares which are bred in the summer and fall and carry their foals for the last half of pregnancy in the winter and spring when the abundant green grass furnishes adequate nutriment to provide for growth of the rapidly developing fetus as well as to maintain their own vigor. Again, the mares finishing their pregnancies in winter and early spring have to provide for a developing fetus and maintain their own nutritive level on relatively poor feed in the late summer and fall. Although not strictly true of the Arabians at Pomona, where the mares are bred every month, according to Caslick,⁴ irregular estrous cycles are more prevalent early in the breeding season and

TABLE 2.—The Influence of the Month of Foaling on the Duration of Pregnancy in 36 Arabian Mares

MONTH	No. FOALED	No. DAYS GESTATION (AVERAGE)	PER CENT CARRIED				
			310-319 DAYS	320-329 DAYS	330-339 DAYS	340-350 DAYS	OVER 350 DAYS
January	21	338	5	0	50	40	5
February	24	342	0	4.1	25	62.5	8.4
March	16	341	6.2	6.2	37.6	25	25
April	16	340	0	6.6	33.5	53.5	6.4
May	14	337	0	30.6	23	38	8.4
June	15	331	14.3	30	35.7	20	0
July	8	330	12.5	25	62.5	0	0
August	16	326	0	80	20	0	0
September	17	332	6	30	47	11	6
October	5	332	0	40	40	20	0
November	8	335	0	25	62.5	0	12.5
December	12	337	16.6	16.6	33.4	33.4	0

become more normal toward the late spring and summer. According to Williams⁵ extreme cold, heat, deficient feed, and disease tend to depress or lengthen the estrous cycle. Irregularities of the cycle, however, do not appear to alter the duration of gestation materially. Whether the irregular cycles are due to genital disease, or to hormonal upset as a result of disease, climate, or nutrition, is a question well deserving further study, but is outside the scope of this paper.

PHYSIOLOGICAL FACTORS AFFECTING THE GESTATION PERIOD

The sex of the foal, the number of previous foals, and the breed are said to influence the duration of pregnancy. Table 3 shows the effect of these factors in the three bands of mares.

To table 3 should be added one pair of viable twins, a colt and a filly, born to a primipara at 323 days. Both are still living and apparently healthy. Von Oettingen³ states that fillies carry their foals longer than pluripara because of the lowered nutritive supply to the uterus. The observations herein reported fail to confirm Von Oettingen's statement except in the case of the 10 U. C. Percheron mares. Von Oettingen³ also states that colts are carried from one to two days longer than fillies. Here, again, except in the case of the Rio Vista mares, his observations are not confirmed. Apparently, these factors are of

limited significance. Breed and heredity differences could not be found uncomplicated by other factors. Possibly they exist.

PATHOLOGICAL FACTORS

These factors account for the most interesting and possibly the most significant influences on the gestation period in the mare. As early as 1901, Sohnle (quoted by Williams²) stated that dams of weak or diseased foals largely go over their time. Later, Sohnle, in a personal communication to Williams² stated that at the famous Marbach stud, from 1916 to 1925, the higher the rate of conception, the shorter the duration of gestation. Williams,² in 1927, presented much reliable evidence that prolonged gestation in the mare has a tendency toward the pathological and that the greater the deviation from the normal of 334 days, the more severe the condition. In 1941, Jennings,⁶ in a study covering four years at a remount depot, showed that the largest percentage of diseased or dead foals, dystocias, the heaviest placentas, and the smallest foals occurred in the year having the longest average duration of pregnancy by three days.

Table 4 shows the breeding records of the Arabian and Rio Vista mares which carried 2 or more foals an average of 320 to 329, 330 to 339, 340 to 349, and over 350 days. The apparent discrepancy noted between the services per conception between this and table 1 is due to the fact that

services resulting in barrenness are not included in table 4.

On the whole, the best breeding records by far have been made by those mares in the 330- to 339-day group, and the worst records by those in the 2 groups of 340 to 349 days and over 350.

Twelve Arabian mares had a total of 49 foals, none of which were foaled dead or aborted, with no barrenness longer than six months. Twenty-four Arabian mares, barren six months or longer, had dead, diseased, or aborted foals, produced 123 foals. The first group carried their foals an average of 334 days, as compared with 337 days for the latter group. Eleven head of normal Rio Vista mares carried their foals 342 days, in contrast to an average of 344.5 days for 32 head which were barren or produced diseased foals.

Williams⁷ has stated that mares conceiving on the foal heat carry their foals five days longer than those which are not bred or do not conceive on the foal heat. It has

TABLE 3.—The Effect of Physiological Factors on the Duration of Pregnancy

	ARABIANS		RIO VISTA		THOROUGH- BREDS*		PERCHE- RONS*	
	No. Days†		No. Days†		No. Days†		No. Days†	
Live colts ..	80	335	42	346	8	338	6	333
Live fillies ..	77	336	59	343	5	340	6	338
Primi-para ..	18	335	16	343	1	333	3	339
Pluri-para ..	154	336	85	343	12	337	10	336

*University of California Thoroughbreds and Percherons.

†Average days.

also been pointed out by Jennings⁶ and others that none but the most healthy and vigorous mares should be bred on the foal heat, in order to prevent diseased foals, abortions, dystocias, and sterility. One hundred and thirteen of the Arabian breedings were on the foal heat, with 50 conceptions (44.5%) resulting in 10 dead foals and an average duration of pregnancy of 335 days. Thirty-seven breedings were later than the foal heat, with 20 conceptions (54%) resulting in 5 dead foals and an average duration of pregnancy of 332 days. Sixty Rio Vista mares were bred on

the ninth day, with 25 (41.6%) conceiving and 3 dead foals resulting. The average duration of pregnancy was 346 days. There were 12 mares not bred on the ninth day; 8 (66%) conceived and carried foals an average of 338 days. No dead foals resulted. Apparently, the reason for the prolonged gestation period resulting from conceptions on the foal heat is due to latent genital disease causing varying degrees of uterine atony and delayed contraction of the uterus.

When from 1 to 3 services were required per conception for the Arabians, the average duration of pregnancy was from 334 to 336 days, but it rose to 340 to 341 days when 4 or more services were required per conception. The same figures were 343 and 345 days for the Rio Vista mares. Here, again, the relationship between number of services per conception and the duration of the pregnancy is somewhat obscure, but it is not amiss to suggest the possibility of genital disease resulting in the greater number of services per conception and being manifested by a prolonged gestation.

Table 5 shows the yearly relationship between the live foal percentage and the average duration of pregnancy. The records for the Arabians from 1933 to 1936 are omitted because of lack of significant numbers, and the years 1937 to 1941, inclusive, are divided into 2 periods to account for the discrepancies noted in duration of gestation as a result of the month of foaling. The average for the Arabians from December to May was 338 days, and from June to November was 331 days.

The Rio Vista figures for 1921 are misleading. Several of this group were young⁸ and, therefore, presumably healthy mares, while several others were aged mares that had been barren or had had diseased foals previously. All in all, the figures seem to substantiate Sohnle's² statement that the higher the rate of conception, the shorter the gestation period. To this might be added, the greater the sexual health of the mare, the shorter the gestation period. Further evidence for this statement is seen in a comparison for the average gestation period and the live foaling percentage of

the Arabians and the Rio Vista mares (table 1).

The average duration of gestation for the Arabian foals by the 6 stallions did not show any significant differences, with two exceptions. One stallion, the oldest in point of service of the 6, whose foals were carried an average of 329 days, showed a 94 per cent live foal crop; while a second stallion, whose foals averaged 342 days, had an 88

per conception, and the others, carried from 326 to 336 days, required an average of three services per conception.

DISCUSSION

It appears, from the observations reported, that under California conditions two factors tend mainly to affect appreciably the duration of gestation in the mare. One is the month of foaling, the gestation period being prolonged in winter and early spring foalings possibly because of the decreased nutritive intake of the mares during the rapidly growing stage of the fetus in the last half of the pregnancy. The second factor is genital disease, prolonged gestation apparently resulting from intrauterine infection. This offers horse breeders another method of determining sexual health of the foaling mare. It is repeatedly emphasized by all authorities on breeding diseases of mares that in order to produce the maximum of healthy, vigorous foals only healthy individuals should be mated. Determination of the sexual health of mares

TABLE 4.—The Relation Between Breeding Efficiency and the Duration of Gestation

	DAYS OF GESTATION (AVERAGE)			
	320-329	330-339	340-349	350 +
Number of mares				
Arabian	7	16	10	0
Rio Vista	0	5	18	7
Breeding years				
Arabian	35	94	60	0
Rio Vista	0	20	70	25
Services per conception				
Arabian	1.4	2.3	2.3	0
Rio Vista	0	2.2	2.5	2.7
Dead or aborted foals				
Arabian	5	5	5	0
Rio Vista	0	0	7	3
Percentage of live foals				
Arabian	94	89	80	0
Rio Vista	0	90	73	68

per cent live foal crop. Four mares were bred once or more to both of the stallions. The average duration of pregnancy of the resulting foals was 332 days for the first stallion and 342 for the second. Although this might, presumably, be a hereditary or individual characteristic, it is significant that the foals from the first stallion are the most highly prized as adults, while those from the second stallion are usually inferior. It is possible that the second stallion is carrying a low-grade infection. Von Oettingen³ has stated that foals carried over 335 days rarely, and those carried over 346 days almost never rank as good brood mares or sires. Sohnle (quoted by Williams²) confirms this by stating that foals carried over eleven months fail in 77.4 per cent of the cases to become valuable breeders. Figures are not available for the breeding records of mares whose gestation periods are known, except in five instances in the group of Arabians. One mare that was carried 348 days required 13 services

TABLE 5.—The Relation Between the Yearling Foaling Percentage and the Average Duration of Pregnancy

YEAR	NO. OF MARES BRED	NO. OF DAYS GESTATION (AVERAGE)		LIVE FOALING (PERCENTAGE)
RIO VISTA				
1917	27	341		85
1918	29	343		60
1919	37	347		59
1920	39	347		53
1921	24	338		58
ARABIANS				
DECEMBER TO MAY				
1937	13	346		76
1938	16	335		70
1939	18	337		84
1940	20	337		85
1941	15	340		73
1942	20	342		85
JUNE TO NOVEMBER				
1937	10	329		90
1938	14	336		76
1939	16	332		87
1940	13	328		86
1941	18	331		80

is often a difficult matter even for experienced veterinarians without resorting to cervical culture and other involved methods. It is believed, however, that a thorough

examination of the placenta of each foaling mare for gross lesions of infection and a careful analysis of the duration of gestation offers a rapid method for estimating the degree of sexual health in a foaling mare. Further, the results are immediate and, should treatment be indicated either in the form of an antiseptic douche or the Caslick operation to prevent postpartum windsucking, it can be done immediately, while the uterus is still available for direct treatment. Those mares which are deemed healthy can be bred on the foal heat, although this practice is not to be recommended strongly under any circumstances, and the others allowed a sexual rest of one or more heat periods. A healthy foaling mare, apparently, is one that shows no important necrotic lesions of the placenta, has not retained her placenta longer than six hours, has a healthy, vigorous foal, and has not carried her foal longer than 340 days, if foaling in the months of December to May, nor longer than 334 days for June to November foalings.

SUMMARY

An analysis of the breeding records of 100 mares, covering 407 breeding years, is presented and the results interpreted with regard to factors affecting the duration of gestation. Apparently, the nutritive intake of the mare during the last half of gestation and genital disease are the two most significant factors influencing the length of gestation. Examination of the placenta, as pointed out by Williams,⁸ undoubtedly shows much, for it is a reflection of lesions on the endometrium. Combined with a study of the duration of pregnancy, a careful placental examination should enable the breeder to have at his command an indication of impending danger and to take the necessary measures to prevent it.

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Veterinarians Needed in New Zealand

Because of a steadily growing consciousness on the part of farmers in New Zealand of the value of keeping livestock in health, there are increased opportunities for veterinarians, reports the New Zealand Dairy Board, the body which, set up under Government authority, deals with the affairs of the coöperative dairy industry there. These opportunities, for the present, are principally in the highly developed dairy industry where the practice is largely confined to dairy cattle and pigs, but it is expected that within the next few years plans will be developed which will take in other classes of livestock.

Veterinarians do not have to undertake the risks associated with starting in private practice. The dairy industry, through coöperative veterinary associations, provides salaried practice under conditions that compare favorably with any in the world. In some cases, individual dairy companies which have several hundred suppliers pay a veterinarian to service those suppliers on a full-time, salaried basis. Up to the present, the work has been concentrated on the treatment of diseases, but it is likely that, as time goes on and more veterinarians are secured for these services, the ideal of disease prevention will be the major one operating in these plans.

The New Zealand Dairy Board does not control any of these projects, but it has detailed knowledge of them, and of the methods of working, and it will put veterinarians who desire further particulars in direct touch with the coöperative associations which can offer opportunities for employment. Any veterinarian who would like to have details of these New Zealand opportunities should, therefore, write to the New Zealand Dairy Board, P. O. Box 866, Wellington, New Zealand.

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Preliminary Observations on Hexachloroethane for Controlling the Common Liver Fluke, *Fasciola Hepatica*, in Cattle

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Angleton, Texas

THE PREVALENCE of the common liver fluke in cattle, particularly in the coastal prairie of Texas where approximately 50 per cent of the native adult cattle are infected, points to the need for a suitable fasciolicide for these host animals. It is desirable that this drug should be not only effective in destroying liver flukes and relatively non-toxic to cattle, but the treatment also should be relatively simple to prepare and administer, and sufficiently inexpensive to permit the economical treatment of entire herds. Of the various drugs known to have fasciolicidal properties, only hexachloroethane appeared from the information available to embody the desired characteristics in sufficient measure to be of promise. This chemical has been used with considerable success in the control of liver flukes in cattle in Germany,⁶ Hungary,^{3,5} Holland,² Italy,^{7,4} and Hawaii.¹ These workers administered treatments over a period of two to four days, although in two of the cases (Pegreff,⁴ and Rosenberger and Slesic⁵), the entire dose was administered in one treatment. Thienel,⁶ Marek,³ and Alicata¹ added, respectively, tetrachloroethylene, filicic acid, and powdered kamala to the hexachloroethane; DeBlieck and Baudet² used hexachloroethane alone, whereas Vianello,⁷ Pegreff,⁴ and Rosenberger and Slesic⁵ used it only with inert materials. The purpose of this report is to record the results so far obtained on the use of hexachloroethane as a fasciolicide, and to outline the methods that have been developed for its preparation and administration.

MATERIALS AND METHODS

This study was conducted under field conditions on range cattle in the vicinity of Angleton, Texas. The animals were treated as groups without previous examinations for fluke eggs.

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fecal specimens being taken at the time of treatment; 352 animals, including adults and yearlings of both sexes, were used. Of this number, 209 showed liver fluke eggs in the feces at the time of treatment; the remaining 143 animals showed no such eggs in the feces but were treated in order to obtain further information on the tolerance of cattle to the drug. The efficacy of the treatments was determined from egg counts made just before treatment and again two to three weeks afterward. In five instances, postmortem examinations were made on animals that had been treated.

Fecal examinations were made on rectal samples. Thirty Gm. of feces were weighed into a calibrated Erlenmeyer flask and diluted to 300 cc. with 0.4N sodium hydroxide. The counts were expressed in eggs per Gm. of feces and were made from 2 aliquots of 2.5 cc. (0.25 Gm. of fecal material) drawn from each flask.

Hexachloroethane (C_2Cl_6) of technical grade, purchased on the open market, was prepared as an aqueous drench by mixing 500 Gm. of hexachloroethane, 50 Gm. of powdered bentonite, and 750 cc. of tap water. The water was added slowly while stirring and the final mixing done by rapid agitation with an electric kitchen mixer, which produced a smooth suspension suitable for use in a drench syringe. This made a total volume of 1,000 cc. with a ratio of 1 part of hexachloroethane by weight to 2 parts of the mixture by volume. The mixture was administered at the rate of 20 cc., which is 10 Gm. of the drug, per 100 lb. of live weight. Preparatory to treatment, the weight of the animal was estimated and the required amount of the suspension was measured into a conical graduate from which the drench syringe was filled. The animals were not deprived of food before treatment and were allowed to return to the pasture immediately after drenching.

The physical condition of the cattle varied from strong, fat animals to extremely weak, emaciated ones, including both lactating and nonlactating cows, as well as cows in all stages of gestation.

RESULTS OF TREATMENT

Of the 209 animals that harbored liver flukes at the time of treatment with the hexachloroethane-bentonite-water mixture, 191 animals were found to be negative

when checked later, in most cases from two to three weeks after treatment; 18 animals were still passing liver fluke eggs at this time. The data of these examinations are given in table 1. It may be noted that 6 animals showed little or no reduction in the number of eggs, and that in one instance there was an increase in the number of eggs after treatment. Probably the latter result may be attributed to variation in sampling. In the other cases where eggs

TABLE 1.—Results of the Treatment of Cattle with the Hexachloroethane-Bentonite-Water Mixture* for the Removal of the Common Liver Fluke, *Fasciola Hepatica*

ANIMALS TREATED†	EGGS PER GM. FECES PER ANIMAL		EGGS PER GM. ANIMALS NEGATIVE FOR FLUKE EGGS‡		%
	ANIMAL BEFORE TREATMENT	NEGATIVE AFTER TREATMENT	POSITIVE AFTER TREATMENT	ANIMAL FLUKE EGGS‡	
No.	No.	No.	No.	No.	
29	4	27	2	4, 4	93
27	8	24	3	4, 4, 8	88
22	12	20	2	4, 4	90
19	16	18	1	4	94
14	20	14	0	..	100
12	24	12	0	..	100
8	28	8	0	..	100
6	32	5	1	4	83
6	36	5	1	48	83
5	40	5	0	..	100
4	44	4	0	..	100
8	48	8	0	..	100
4	52	3	1	4	75
5	56	5	0	..	100
1	60	1	0	..	100
1	64	1	0	..	100
2	68	2	0	..	100
3	76	3	0	..	100
3	80	2	1	4	60
1	84	1	0	..	100
1	88	1	0	..	100
4	92	3	1	8	75
1	96	1	0	..	100
3	104	3	0	..	100
1	108	1	0	..	100
2	112	2	0	..	100
1	116	1	0	..	100
3	124	3	0	..	100
2	132	2	0	..	100
1	164	1	0	..	100
1	168	1	0	..	100
2	180	2	0	..	100
1	196	1	0	..	100
1	204	0	1	4	0
1	208	0	1	4	0
1	212	1	0	..	100
1	256	1	0	..	100
1	296	1	0	..	100
1	308	1	0	..	100
209	191	18			91

*The hexachloroethane-bentonite-water mixture was given at the rate of 10 Gm. of hexachloroethane per cwt., estimated, at a single dose.

†Grouped according to number of eggs per Gm. of feces.

‡Negative for fluke eggs in each category.

persisted, the number was greatly reduced. There appeared to be no correlation between the intensity of the infection and the number of eggs remaining after the treatment.

Rechecks at later dates were made on 10 animals to determine whether they remained negative for fluke eggs. One bull (PLP 28), passing 48 eggs per Gm. of feces when treated on January 8, appeared to be negative on January 13; 29 subsequent examinations made on 5 fecal samples between February 18 and 24 were all negative. Nine other bulls (Clemens), passing from 4 to 112 fluke eggs per Gm. of feces, were treated September 21; all were negative about five weeks later and again on February 13, except for 1 animal that showed 4 eggs per Gm. on the latter date. This animal was passing 36 eggs per Gm. at the time of treatment. In the above cases, from 7 to 15 examinations were made from each sample of feces taken on February 13. The animals in question had remained on infested pastures from the time of drenching. Since about three months are required for flukes to reach sexual maturity after entering the host, it is possible that the 1 animal previously mentioned may have become reinfected subsequent to treatment. It is also possible that young liver flukes were present in this animal at the time of treatment and that their development was unaffected by the drug.

Five postmortem examinations following treatment were made on animals that were killed because of their weakened condition due to the liver fluke or to accidents. One old bull (Ramsey 70) showed 12 eggs per Gm. of feces when treated on August 14, but when killed on August 25, no flukes were present in the liver. A young cow (Ramsey 47) showed 21 fluke eggs per Gm. of feces when treated on August 9, but was negative when reexamined on August 25. Following accidental death in the pasture on September 11, this cow was examined and found to be negative for liver flukes. A young bull (Clemens 101) showed 168 eggs per Gm. of feces on October 16 but none were found two to three weeks later; he was killed on November 26 and no flukes were present in his liver. A young cow (Clemens 74) showed 48 eggs per Gm. of

feces at the time of treatment on August 19. Because of a serious injury to her shoulder while being held in the chute for taking the second fecal sample, she was killed on September 22. No flukes were present. Another young cow (Clemens 60) showed 196 eggs per Gm. of feces when treated on August 19 but appeared negative on September 2. The cow showed no improvement in her emaciated condition and was prostrate on December 8, when she was destroyed. A few flukes were present in the liver. It should be noted that approximately four months had elapsed between the time of treating this animal and the postmortem examination, during which time she had remained on the infested pasture.

When treated with hexachloroethane-bentonite-water mixture at the rate of 20 cc., which is 10 Gm. of hexachloroethane, per 100 lb. of live weight, no ill effects were shown by the cattle. Considerably larger doses were given without visible effects on the animals but no data are available at this time regarding the maximum dose tolerated. Doses of 100 Gm. and larger were well tolerated by young animals (600 lb. or more) in good condition. Such large doses, however, have not been administered to extremely weak animals. Debilitated animals received the usual 10 Gm. per 100 lb. of live weight without showing undesirable effects. No deaths were attributed to the treatment of the cattle with the hexachloroethane mixture, although some of the animals were in a weakened condition at the time of treatment.

DISCUSSION

The results presented in this preliminary study on the hexachloroethane-bentonite-water method of treating cattle for the control of the common liver fluke are encouraging. They indicate that when given in this manner the drug is efficient in destroying liver flukes and that the treatment is relatively non-toxic to cattle. The simplified method of drenching the animals with the hexachloroethane in a single dose that is readily measured is important in the economy of time and handling of wild, range cattle for treatment.

While the results of this study are based, for the most part, upon egg-counts rather than upon critical tests of the efficacy of the treatments, they indicate that a significant measure of control can be exerted upon liver flukes of cattle through systematic treatment with hexachloroethane.

Treatments of cattle with hexachloroethane alone, or with hexachloroethane and kamala, in capsules, did not give results superior to the drench method. Hexachloroethane dissolved in tetrachloroethylene produced an undesirable narcotizing effect which, in the case of debilitated animals, proved fatal.

SUMMARY

1) Commercial hexachloroethane of technical grade was mixed with powdered bentonite and water at the rate of 500 Gm. of hexachloroethane, 50 Gm. of bentonite, and 750 cc. of water to make 1,000 cc. of suspension having 1 Gm. of the drug to 2 cc. of the mixture. This was administered readily with a drench syringe.

2) Cattle received 20 cc. of the suspension (10 Gm. of hexachloroethane) per 100 lb. of live weight. Fasting before and after treatment was not necessary.

3) When the cattle were given the hexachloroethane-bentonite-water suspension at the rate of 20 cc. per 100 lb. of live weight, no ill effects were manifested. Doses up to 200 cc. (100 Gm. of hexachloroethane) did not produce symptoms of toxicity.

4) Of the 209 infected animals treated, 191, or 91 per cent, showed no liver fluke eggs when examined two to three weeks later.

5) Of 10 animals that were repeatedly examined from five to twenty weeks after treatment, one showed an infection of 4 eggs per Gm. of feces. This occurred after five months on infested pastures.

6) Postmortem examinations were made on 5 animals infected with liver flukes at the time of treatment. Four of them were negative when examined shortly after treatment; the fifth, which had showed 196 eggs per Gm. of feces at the time of treatment, appeared to be negative two weeks later but

was found to harbor a few flukes when examined *post mortem* four months later.

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Veterinarians to Play Important Role in Food Production

Sir John Orr of the Rowette Institute, Aberdeen, Scotland, and Dr. Frank G. Boudreau, Chairman, Food and Nutrition board, National Research Council, Washington, D. C., were guests of the American Society of Animal Production at a luncheon, December 2, in Chicago.

The vital necessity for expanding the use of the protective foods (meat, milk and eggs) in every section of the world was emphasized by both speakers. It is now known that the Allied Nations are providing additional food for the inhabitants of areas occupied by our armies. As this food plan is expanded, the need for huge quantities of such products is apparent. If agriculture of the world is to produce the amount of food recommended then livestock production in America must be greatly expanded and operated on a more efficient basis. Sir John Orr indicated that, if carried out according to plan, 40,000,000 additional acres will be needed to do the job. These experts hope to encourage an increase in the consumption of the protective foods—meat, milk, eggs—cereals and their by-products from 15 to 100 per cent. The

available supply of liquid milk should be doubled.

Why are such recommendations desirable? At present, records in the British Empire indicate that with a 50 per cent increase in the consumption of these protective foods there is a 30 per cent decrease in human illness—thus, there exists a direct correlation between food adequacy and human health. Data rapidly accumulating in the literature likewise show a direct relationship between food adequacy and animal health. Much can be accomplished in keeping livestock healthy through a well organized program of scientific feeding:

At the present time, however, there exists a serious loss of livestock and poultry in this country due to *nutritional* and *infectious diseases*. It is the duty of the veterinary profession to help cut these losses to the minimum. This will require the services of many more veterinarians. Men with special training will be in demand. To produce these, certain revisions in our present veterinary curriculum will be necessary. New information must be made available for practitioners already in the field. It is through the section on Nutrition in the Journal that the Committee on Nutrition of the American Veterinary Medical Association hopes to make available for the practicing veterinarian, some of the information which may be of assistance in accomplishing these purposes.

s/M. L. Morris.

The Food Goals for 1943

The amount of meat American farmers have been asked to produce in 1943 is 27,700,000,000 lb., which is 16 per cent more than the poundage of 1942. This will require a 15 per cent increase in the hog crop, 14 per cent more beef cattle, and 5 per cent more sheep. In the poultry field, the goals sought are 4,000,000,000 lb. of chicken and 560,000,000 lb. of turkey. The expectation in eggs is 4,000,000,000 dozen. —From an article by Grover B. Hill, Assistant Secretary of Agriculture, in the *Breeder's Gazette*.

Recommendations on the Control of Diseases of Dairy Cattle to Meet Wartime Needs

Special Committee on Diseases of Dairy Cattle

THE PRESENT national emergency demands an increased production of dairy cattle and dairy products. There are many problems among dairy herds which can be solved if herd owners and their veterinarians will coöperate fully in the application of available knowledge.

One aim of this committee is to outline certain health control measures applicable to most dairy herds in America. Obviously, it is impossible to discuss the details of all of the disease problems met in all parts of the United States.

NUTRITION

New facts in animal nutrition and biological chemistry have accumulated so rapidly that it is futile to attempt to discuss them completely. A few fundamental principles regarding the feeding of cattle should however, receive more attention.

The nutrition of the breeding bulls is one of the most vulnerable parts of the program of dairy cattle feeding. Ideally, it is agreed that the bull should receive a regulated amount of good quality roughage from soil that has been highly fertilized. He should have a spacious outdoor yard connected with his box stall. The best methods of pasture improvement should be employed on the grass plots upon which herd sires graze.

A low-protein grain ration containing the recommended amount of salt and steamed bone meal should be fed liberally. The quantity of roughage should be decreased rapidly in bulls that tend to become inactive. By this method, reduction in the size of the abdomen can be accomplished if inedible material is used for bedding.

Without highly active, fertile herd sires, dairy herds cannot reproduce efficiently. To this end, diets for bulls may include 5 Gm. of chloretone (chlorobutanol) daily, or 1 to 2 oz. of concentrated cod liver oil daily for two- to three-week periods. These products are reputed to increase the vitamin

C content of the blood and semen. Obviously, these supplements should not be necessary if the bull's diet is correct at all times.

The nutrition of the dairy cows is apparently in danger of becoming faulty in many areas due to the shortage of steamed bone meal. It is hoped that added phosphorus, if needed, may be supplied through the use of defluorinated rock phosphate in lieu of steamed bone meal. Dairymen should be cautioned against neglecting to supply cattle with a source of phosphorus, especially when home-mixed grains are used. Special care should be taken not to use phosphatic limestone from which the fluorine has not been removed, because fluorine poisoning may occur from the use of the raw rock.

In view of the possible shortage of concentrates with a high percentage of protein, it is necessary that cows receive leguminous hay of high quality grown on highly fertilized soil. It is equally essential that dairy herds should graze only on the best pasture that modern methods of fertilization and improvement can produce. Better roughage from these two sources will not only help to supply the cows with adequate carotene, but will also supply some of the much needed protein and minerals. Grain mixtures which contain yellow corn less than one year old also should be valuable as a source of carotene.

It is desirable to furnish dairy cows in advanced pregnancy with at least a small amount of sun-cured, green-colored hay, or other roughage having a high carotene content. By this method of feeding cows, their calves are born with an adequate reserve of vitamin A in their systems. Too, the colostrum of the cows is more likely to be high in vitamin A. On the contrary, a method often employed is to feed dry cows the poorest hay on the farm and a large amount of grain.

The nutrition of the newborn and young calves has been studied carefully at many experiment stations. One conclusion is that some calves born in the winter months are likely to have a low vitamin A reserve at birth. In attempts to prevent scours, calves may receive such small quantities of milk that too little vitamin A is ingested, even though the colostrum contains the normal amount.

Many owners, therefore, have found it beneficial to give each calf 1 to 2 dr. of concentrated cod liver oil daily as a source of vitamins A and D. This is continued with good effect until the calves are 6 months old. Where a good grade of pea-green alfalfa hay is available, cod liver oil is not necessary as a source of vitamin D. Concentrated cod liver oil, however, has been proved to be harmless. If it or some substitute containing vitamins A and D can be obtained, the loss from calf scours, calf pneumonia, and the possible damage from rickets would be reduced. Many deaths occur in spite of this attempt to improve the nutrition of baby calves. This is particularly true in certain large herds where calf diseases are enzootic.

The well-known rules of sanitation and careful feeding of calves must not be neglected whether or not vitamin supplements are used. The various vitamins of the B group, now included in most dry calf starters or pellets, seem to aid the growth of calves. Dried brewers' yeast is a rather cheap and convenient source of the vitamins that are beneficial to the appetite and to the functions of the digestive tract.

PREVENTION AND TREATMENT OF CALF DISEASES

Improvement can be made in the control of calf scours and pneumonia by the use of sanitation and nutrition. In spite of the application of available knowledge, however, the death rate among purebred calves on large breeding farms is high. Many calves that survive scours or pneumonia are more or less stunted or otherwise permanently damaged. Better care of the calves yields mature animals that will breed and produce in the desirable way.

It is difficult to raise healthy calves sub-

jected to the virus of calf scours and pneumonia, and in the presence of a virulent colon organism and other organisms. As preventives there are two helpful and practical procedures: (1) Keep the calves away from the infection as completely as possible, and (2) feed and house the calves in such a manner that they will be more resistant to the infections. These two procedures go hand in hand.

To protect the newborn calves from infection, have each calving stall scrupulously cleaned before a cow is placed there to calve. Use a hot, 3 per cent solution of Lewis' lye to remove filth and dirt from the walls and floors, follow with a 3 per cent compound cresol solution or other good disinfectants.

House calves in small, calf units that provide individual box stalls for 8 to 10 calves each. Some dairymen raise calves successfully by providing a small, movable pen for each calf. At any rate, a small group of calves should be started together and kept together (if they remain normal) until they are 4 months old. These small groups can be housed in a dozen places on a large farm without building many calf barns.

It is desirable in the construction of calf barns to use wood with insulated walls and roof. The calves should be kept on wood floors; or wire 6 inches above the concrete floor. (The use of concrete floors is allowable, however.) If a deep layer of cinders for insulation is placed under a shallow concrete floor, no other surface structure will be necessary. In winter, the bedding should be deep and changed daily so that the calf never lies on the concrete. Artificial heat may or may not be necessary, depending upon the climate and the windbreaks provided. Each of the calf units should be disinfected in the same manner as the maternity stalls. This is particularly important after a calf affected with scours or pneumonia has been removed. Thorough disinfection, and also leaving the calf units vacant are desirable after each group of calves has been removed from their particular barn. Sick calves should be isolated at once, and, if possible, cared for by someone not in charge of the normal calves.

There are other methods of providing

similar isolation. For example, a few bull calves may be raised on nurse cows, even on cows having defective udders. This method is not desirable for heifer calves. The heat furnished by nurse cows is beneficial to calves in cold weather.

STANDARD FOR RAISING CALVES

- 1) Permit the calf to remain with the cow for twelve or even seventy-two hours, then remove it and muzzle at once.
- 2) Give the calf no feed for twenty-four hours after it is removed from its dam.
- 3) The calf should receive the dam's milk until 5 to 10 days old. After the fourth day, hand feed on the dam's milk, with a nipple pail or ordinary, clean, drinking pail.
- 4) Determine the amount of milk fed as follows: Six to 10 per cent of the calf's body weight constitutes a maximum daily allowance of whole milk. Weak calves may not be able to take over 6 to 8 per cent of the body weight of milk. Separate this amount into two feedings each day. At no time allow the Jersey or Guernsey calf to receive more than 8 pounds of whole milk daily, nor the Holstein-Friesian calf more than 10 pounds of whole milk daily.
- 5) Select only cows with udders sound in every respect and reasonably fresh (within four months of calving) to produce milk for the young calves. Allow three days for a gradual change from the dam's milk to the fresh cow's milk.
- 6) When the calf is 30 days old (or on the same day of the month after the calf is born) start feeding of grain while it is still tied up. Feed the grain in the milk bucket or small feed box, immediately after the milk has been consumed. The grain may be a calf starter, pellets, or a mixture such as yellow corn meal, rolled oats and mill feed plus 1 per cent of salt. Determine the amount of grain to be given the calf by the amount it will consume within thirty minutes.
- 7) Keep the calf muzzled until it is 45 days old, then begin feeding a bright green, clean, mixed hay. This provides vitamin A and minerals as well as bulk. Many breeders start calves on high quality hay when they are 3 weeks old. If the calf is started on a specially prepared calf starter mash or pellets, it is recommended that at 3 months of age the grain ration be changed to equal parts of corn, bran, and oats, or to some other comparable ration.
- 8) At 2½ to 3 months, or even as early as 30 days of age, gradually change the calf's milk diet to skim-milk. At 3 months of age allow Jersey and Guernsey calves to receive 12 pounds of skim-milk daily and Holstein-Friesian calves 15 pounds of skim-milk daily. Continue to feed skim-milk until the calves are

6 months old. (If available, use Holstein or Ayrshire milk; one Holstein, recently fresh, will produce milk sufficient for several calves.)

9) Wash and steam the milk buckets after each use.

10) While calves remain in their stalls, offer fresh, clean water once daily, preferably midway between feedings. While calves run in the pasture, furnish a tank of clear, fresh water so that they can drink at liberty.

It is difficult to differentiate between prevention and treatment of calf diseases. As treatment for scours and pneumonia, some advise the use of 4 to 8 cc. of concentrated cod liver oil or other vitamin A and D concentrates once daily. In the same way, brewers' yeast may be used, or a more expensive source of vitamin B may be supplied as treatment after trouble has developed. On many farms, as previously stated, these products are used as routine prevention.

The same can be said of the use of sulfapyridine, sulfathiazole or other sulfa compounds. In herds where calf losses are heavy, a few owners prefer to treat all calves, using 1 to 2 Gm. or more of some sulfa drug three times daily for a few days. There is no doubt that correct dosage and use of these agents will save the lives of many calves if treatment is started early in an attack of septicemia of the newborn with or without scours. In pneumonia in older calves, the sulfa drugs are useful also if used early and in rather large doses.

The transfer of 250 to 500 cc. of the dam's blood to the calf at birth, or any time before it is 2 weeks old, often has given wonderful results. This is most easily done by putting 1.5 Gm. of sodium citrate in a pint bottle and drawing blood of the dam into it. It is immediately shaken and filtered through gauze, and may be given intravenously or preferably injected subcutaneously at several places. This may be repeated twenty-four hours later if needed.

Biological products such as antisera (to prevent septicemia developing from the colon group of organisms), bacterin, or aggressin seem to provide considerable immunity to calves on certain farms. Immunization at three- to six-month intervals, using the bacterin or aggressin, seems to

prevent pneumonia on farms where hemorrhagic septicemia may or has been known to exist. However, the initial cause of much of the calf trouble is, generally, a filterable virus not related to biological products and, therefore, not specifically controlled by them.

Each calf and each herd is a problem unto itself and special pharmaceutical agents containing bismuth, salol, kaolin and various other products may be needed to take care of particular cases. In the outline given above, an attempt has been made to aid the herd owner in preventing heavy losses among his stock.

BREEDING PROBLEMS

Dairymen in the eastern United States and Canada have been repeatedly advised by their committees on "herd health" that prevention of disease is important. This applies particularly to the problem of increasing the reproductive efficiency. Instead of allowing the usefulness of the average dairy cow to be as short as three to four years, the owners realize that some plan should be developed to make the cow last longer and still produce a calf about once per year.

Such phenomena as the expulsion of dead calves at term, prolonged gestation with dystocia, abortions, retention of fetal membranes, and sterility occur in herds supposedly free from specific infection of the genital organs. The nature of the causes in all of these instances is not entirely clear, but the importance of genetics and nutrition in relation to the problems is recognized. It is urged that veterinarians gain information in these subjects, and that all veterinary colleges add courses in genetics and nutrition to their curricula.

The problem, in herds with unusual reproductive disturbances, is to estimate the importance and relationship of the various causative factors. These include heredity, nutrition, overwork from high production, forced reproduction, and infection, all of which, and many others, may be operative at once in large dairy herds.

A specific example of what is meant by these causes is the common practice of breeding dairy cattle too soon following

calving. When dairymen allow cattle to be bred three to five weeks after calving, the loss from genital disease is increased. There is a greater tendency for breeders to practice such early breeding when they are being urged to raise more calves and produce more milk. A greater number of live calves and a much greater production of milk will be obtained if such overwork of the reproductive organs is avoided. In extremely high producers, a calf every fifteen months is about all that should be expected. In commercial herds, however, where moderate production such as 9,000 lb. of milk per year or less is the requirement, the aim should be to obtain a live calf every twelve months.

The large animal practitioners are in a position to assist in bringing about the ideal reproduction if the owners will allow them to put on a program of health control based on a plan similar to the following:

- 1) Visit the herd regularly every month, or at least every few months, and keep accurate records of the breeding history of each cow.

- 2) Check every cow in the herd frequently to record the condition of her genitals.

- 3) Recommend that all cows with reasonably normal genitals be bred on their first heat after sixty days from calving. Cows whose parturition was abnormal should have a rest of at least ninety days before being rebred.

- 4) The genital tract of cows that are due to breed before the next visit should be carefully examined and curable abnormalities corrected so that they may be bred on time.

- 5) Each cow that has been bred seven weeks or more should be examined for pregnancy. If found open, try to ascertain the cause and correct it if possible.

- 6) If a cow is more than sixty days from calving and has not been in heat, press out the corpus luteum if present; if not, bring in heat by using a commercial estrogen such as theelin, progynon-B or stilbestrol. The use of other hormones to stimulate ovulation would include such substances as anterior pituitary extract and gonadin.

- 7) Cows with abnormal genitals should be withheld from breeding and treated until they return to normal. If hopelessly sterile, they should be marked for slaughter as soon as they cease to produce profitably.

When the above outline is faithfully followed, a high percentage of the cows in some herds will freshen every twelve months. This not only increases, substantially, the average pro-

duction per cow but also cuts the turn-over in cows nearly 50 per cent by keeping that large number of cows in the herd as producers that the owners normally sell for one of the following reasons:

a) The herdsman or owner thought they were all right to breed when they were diseased and continued to breed them until their production was so low that it would not pay to carry them through to another lactation.

b) The cows were assumed to be pregnant and it was not determined otherwise until they had nearly ceased to give milk. It was then too late to start treatment and carry them until they calved again.

c) Heat was not detected in several cows until they had produced milk too long and were unprofitable to maintain until another lactation.

Dairymen agree that one of their greatest losses and one of their most annoying disease problems is the failure of cows to breed regularly. It is seldom that a veterinarian is called where the cows are approaching this ideal of a calf every twelve months. In one herd of 150 head of milking cows, under the supervision of a member of this committee, the average time between freshening and conception was six and one-half months. The loss here was serious and the increase in breeding efficiency, since the above plan was tried in the herd, has been correspondingly great.

The exact importance of such therapeutic agents as hormones and vitamin C therapy is being learned gradually. The greatest good may be expected from such products in cattle where no serious lesions are present in the endometrium, cervix or oviducts and ovaries. At present, considerable interest has been aroused by reports that chloretone given *per os* raises the vitamin C content of the blood of sterile cattle whose genitals appear normal. The idea seems sound.

Nothing, however, can displace good judgment on the part of the herdsman and the veterinarian and the careful and frequent examination of the breeding animals. These examinations should result in the prompt condemnation of bulls and cows that are incurably diseased. This accurate process of culling is one of the most important parts of a program to increase breeding efficiency.

Our veterinary colleges make a special effort to give their graduates an opportu-

nity to become proficient in this type of work. It is believed that at least one cow for each senior student should be maintained for instruction in breeding work. Several bulls should be made available for complete examination by students, because of the increasing importance of the phases by veterinary service dealing with diseases of the reproductive organs.

The importance of nutrition to the genital soundness and fertility of the bull has been mentioned previously. It is essential, however, to emphasize the fact that bulls should be examined for fertility in herds where the breeding efficiency of the herd is low.

The use of the modern artificial vagina is the most desirable way to collect semen from a bull that will breed actively enough to use one. Often, one is able to determine that a bull is not delivering suitable semen by gross examination of the semen collected in this manner. The semen should be white, greyish white, or, rarely, yellow, and should contain small, whitish granular flocculi that often move slowly in the test tube. The microscopic examination should show not only a normal number of sperms actively motile, but this motility should persist for two to six days, depending on how carefully it is refrigerated and how it is diluted. The egg-yolk-citrate or phosphate buffer of Phillips seems to give the best results in the storage of semen to estimate the duration of motility. These tests cannot be applied well to semen collected from a cow's vagina or by massage of the bull.

The bull should have normal genitals and ability, and a desire to breed. It is especially important to palpate his testes for evidence of orchitis. A repeated examination of cotton swabs of the base of his glans penis and adjacent prepuce after the swabs have been soaked in physiological saline for one to two hours should show an absence of *Trichomonas fetus*. The blood test for brucellosis should be negative. A young or older bull that will pass these rigid tests, if used moderately, will be very apt to prove highly fertile if mated with equally normal females. It is often striking to compare the breeding records of the various bulls used in a large herd. The substitution of a fertile bull for one with a bad breeding record

usually will prove to be an efficient way to help solve the sterility problem in a herd.

The part played by trichomoniasis in diseases of the reproductive organs is not known. In the opinion of the members of this committee the disease is not at all common, but it is a serious problem in certain well-bred herds where older valuable sires are frequently moved from herd to herd. It is also possible that it may be brought into a herd by purchasing open cows or cows in early pregnancy. It is a rare disease and an unimportant problem in most farmers' herds where the only bulls used are ones that are raised as calves and where no outside breeding is permitted.

The well-known symptoms consist of sterility, vaginitis with larger granules or nodules on the walls of the vagina near the cervix, early abortions often unobserved, and fetal maceration with an unusual pyometra. It cannot well be confused with other types of genital disease of cattle. The direct microscopic examination of pus or mucus taken directly from the uterus, cervix or vagina will often reveal the large, motile Protozoa, *T. fetus*. The most accurate way to determine whether a valuable herd sire is infected and a carrier of the disease is to find the organisms in heifers that have been bred to this particular bull and no other. It may require several examinations of the vaginal contents of the heifer, starting from ten to fifteen days after they have been bred.

Control of this disease is relatively simple, but requires that accurate breeding records be kept and that the herdsman follow instructions. One slip is all that is necessary. If a normal bull is permitted to breed an actively infected female, the bull may become infected. Many bulls thus infected become permanent carriers and are able to infect any susceptible cows or heifers they breed. A bull infected with trichomoniasis can infect females that are artificially bred with his semen. The disease may be controlled by strict attention to the following rules:

- 1) Obtain a normal sire or sires and do not breed any cows directly. Breed all females in the infected herd artificially. After all cows

and heifers have calved normally, there is no further necessity to use artificial breeding.

- 2) If it is impossible to breed the entire herd artificially, divide the herd into two groups: a clean group and a group that has been exposed to the infected bulls.

- a) The clean group of females will consist of cows that have not been bred since they calved at term, and all virgin heifers. Breed these females to any normal, fertile sire.

- b) The infected group that remains, after the herd history is studied, may be bred artificially. They should, however, be given at least three months to recover from trichomoniasis. Sexual rest plus suitable treatment will usually result in recovery. They may then be bred directly by a fertile sire that will not be used on any cows in the clean group.

- 3) Some degree of success may be obtained by simply breeding the exposed animals to the infected sires, trusting that the natural resistance developed to the disease will be sufficient to guarantee fertility. This is but moderately successful.

- 4) All infected sires should be treated or slaughtered, or their services should be carefully confined to females previously exposed to them.

- 5) Keep the clean herds free from trichomoniasis by using the preceding suggestions regarding the spread of the disease. The plan of using each sire in any herd on a given group of females, not allowing those cows to be bred to any other bulls until they have calved, tends to prevent the spread of this disease and other types of genital infections.

BRUCELLOSIS (BANG'S DISEASE)

The importance of brucellosis among the cattle of the United States and Canada cannot be accurately estimated. During a period of seven years in which 48,117,000 blood tests and retests were conducted by the United States Bureau of Animal Industry, 2,134,000 reactors were disclosed. It has been stated that if all of the dairy herds were free from this serious, infectious disease, the milk production would be increased perhaps 20 per cent or more.

The control of brucellosis in cattle has depended, during the last few years, upon various plans. One of these was the test and slaughter method. This was applied to individual, scattered herds, or to all herds in an area. Under the area plan, much progress was made in those areas where the percentage of infection was low. The test and

segregation method has proved to be useful for large breeding establishments that are able to maintain a positive and a negative herd. Much private testing, without indemnity, has been done with good results. Many clean herds have been maintained for thirty-year periods by these methods. Proper herd management and frequent disinfection of all infected stables and premises were important parts of all of these programs.

Calfhood vaccination with *Brucella* antigen (strain 19) has been used extensively during the last seven or more years. At first, it was limited to calves in infected herds, but the results were so encouraging that many calves in clean herds are now being vaccinated. Time will determine whether this is a wise practice. It is well known that a surprisingly high degree of resistance is developed by a single injection of this living culture, but perfect immunity of all calves vaccinated has not been obtained. Some failures may result from careless handling of the vaccine, which should be freshly made and carried about in a thermos box at all times. The injection of dead cultures or contaminated vaccine will not produce good results. One rarely hears of a serious abortion storm among cattle which were properly vaccinated as calves. Reactors among vaccinated cattle are common when they are exposed to infection. On the other hand, serious outbreaks of abortion are frequent among negative herds in highly infected areas. It is hoped that calfhood vaccination will eliminate many of these serious outbreaks among highly susceptible cattle in negative herds of such areas.

It seems wise and essential during the present emergency to subject all of the dairy cattle, and many of the beef herds used for breeding purposes, to one or more of the above-mentioned methods of fighting brucellosis.

Herd owners in each area must adopt the plan that seems best suited to the local needs. It seems obvious that a greater amount of testing on an area basis, with elimination or segregation of reactors, would accomplish a great deal for the dairy industry. In time, the results of such work

should increase the meat and milk supply for the whole country. Calfhood vaccination should be used in all areas where most of the herds are infected. The ultimate aim, however, should be to maintain abortion-approved herds or vaccinated, abortion-approved herds. In both of these types of herds, all cattle of breeding age would be negative to the agglutination test.

It is planned at present to redistribute a great many dairy cattle in order to save them from going from forced sales on dairy farms direct to the packing plant. In this way, many outbreaks of brucellosis are bound to be started unless definite attention and supervision is given the herds sold and the herds into which they will go. Limiting redistribution of cattle to those herds that are free from brucellosis would be a safe procedure. It would be unsafe to add clean cattle to infected herds where the disease is not under control. The advice of veterinarians should be sought in carrying out the details of this program.

There is danger in the wholesale resort to the popular and highly valuable plan of calfhood vaccination. If owners and veterinarians accept the idea that the vaccination of calves will stop the mature cows in the entire community from aborting, serious abortion storms may be developed from a general lack of interest in known methods of prevention of brucellosis. It is desirable to retain the valuable features of the various blood-testing programs until the immune calves reach calving age. These sound procedures include the application of proper sanitation in all dairy barns, especially in maternity stalls, the isolation of all cows at calving time, as far as possible, and isolation and treatment for abortion and retained placenta. It is important to stress the danger of infection spreading during the summer when infected and clean cattle come in contact while at pasture. Many of the most serious storms of abortion follow such exposure. It should also be kept before the dairymen that frequent blood testing, with the elimination or complete separation of all reactors, will do a great deal to insure the success of the very useful calfhood-vaccination program. Even in the highly infected herds where this is not prac-

tical, it is often desirable to sell the poor breeders, the chronic aborters, and those cows whose genital organs show the most pathological changes.

Great progress must be made in the control of brucellosis if the dairy industry is to be prepared to meet the national, and perhaps later the international, demand for sound, disease-resistant dairy cattle. Vaccination, if used wisely in conjunction with the blood test, should make possible a real advance in the control of brucellosis in cattle.

MASTITIS

It is generally suspected that mastitis causes more economic loss than bovine tuberculosis or brucellosis. This chronic, infectious disease has failed to attract an equal amount of public attention because relatively little disease of man results from the use of milk from infected herds. It is admitted by all that the quality of the milk would be greatly improved and the quantity increased 20 to 25 per cent by elimination of mastitis from dairy cattle. A recent report from New Jersey indicates that half of the cows that dairymen are forced to sell as useless are sold because of this disease. In that small state, it is estimated that the value of the cows sold in a year because their udders were diseased would amount to \$2,600,000. No one can accurately estimate the reduction in the total production of milk in America because of failure to prevent and control mastitis in dairy herds. Mohler *et al.*, in their last report, estimate that the annual loss from mastitis, as of Jan. 1, 1942, was 19 million dollars. When we consider that cows have doubled in value since that time, the solution of this problem becomes a challenge to our profession and to dairymen, and a serious attempt to solve it should be made.

A discussion of the causes of mastitis could fill pages. All authorities agree that the most common cause is infection through the teat orifice. The infectious agents include various strains of *Streptococcus agalactiae* and other streptococci, as well as many other pus-forming organisms. The part played by other causes that accelerate

the activity of these specific and nonspecific bacteria must be stressed. Injuries involving the ends of the teats may occur in any herd, but are more common if the udder is large, as in good producers, and in herds where the cows stand too close to one another with no partitions. Mechanical milkers, if improperly handled, may cause a swelling of the ends of the teats, with irritation of the teat orifice, which lowers resistance to infection. Trauma of the teats or udder may develop from the same causes. Heavy feeding, with too much protein in the grain and roughage, apparently has an important part in bringing out active mastitis in the presence of otherwise mild infection.

The drying-off process and improper care of the udder during the dry period often permit the disease to progress. It will be evident at the time of parturition when one or more quarters that were dried off in a supposedly sound condition show a purulent secretion and marked fibrosis. Few cows have udders so free from infection that it is safe simply to stop milking and give them a two- to three-month dry period without examining the udder rather frequently. Perhaps the practice of feeding heavily during the dry period has a tendency to stimulate the secretory function of the udder and resultant infection. At any rate, there is a good chance that any dairyman who will examine the "dry secretion" from the cows that are supposedly normal will find a few quarters containing pus or a mixture of pus and a watery secretion. The normal secretion in a dry cow's udder should be milky or, later, oily. An abnormal secretion and infection tends to destroy the gland tissue of the udder unless it is discovered and given prompt treatment.

Much remains to be done by those conducting studies on the etiology of mastitis. It is urged that those who are working on diseases of cattle at experiment stations and other institutions make every effort to find additional useful facts regarding the cause, diagnosis and prevention of this disease.

However, existing information regarding diagnosis and prevention could be used to

greater advantage. There are not sufficient funds nor personnel to conduct laboratory examinations of milk samples of all the cattle producing milk, nor is it essential that this be done. If a careful physical examination is made frequently, most of the badly infected cows will be detected. When possible, the accuracy of this type of clinical work should be checked by use of the Hotis and other laboratory tests.

Many owners of valuable cattle have learned a great deal about the diagnosis and prevention of mastitis which saves them money and increases their efficiency as dairymen. Others, however, are interested only in cure, with no regard for prevention. The present treatments, especially udder infusions, are promising. They are also a threat to successful control of the disease. When there is a cure, there is a tendency to neglect removal of the cause. Few of the advanced cases can be easily and completely cured. We should, therefore, keep before our clients the idea that the cow with mastitis is a menace in any herd, and that it is to their advantage to prevent infection by eliminating or isolating the cows whose udders are diseased. Dairymen should also give strict attention to many other rules of sanitation that may help to prevent the development of the disease.

Rather recently, it has been pointed out that the proper technique of milking may do a great deal to decrease the time required for milking and, incidentally, decrease the incidence of mastitis. We refer to the fact that the udder should be milked dry at once and as rapidly as possible after the cow has "let down" her milk. A gentle massage of the teats and udder with the dry hand, to remove dust and bedding, and milking a few streams into a strip cup will stimulate the action of the hormones that control milk secretion, causing the udder and teats to become tense and full. Follow the massage at once (not fifteen minutes or two hours later) by complete milking. The usual practice of washing the udders of the entire herd with warm chlorine solution and then at some later time starting to milk is conducive to slower release or "let down" of the milk. This means that a mechanical

milker must be left on much longer and will exert more pull and possibly cause more trauma than if it is put on at the correct time. Few cows should require that the machine be left on more than three to six minutes if they are properly prepared and then are milked at once. Any adjustment of the vacuum and speed of pulsation of a milking machine should be done by an expert with machines rather than by some attendant who wishes to apply more speed to the milking process. The speeding-up process, by the use of too high a vacuum or too frequent pulsations, may greatly damage the udder and teats. The average man should not try to operate more than two units at once. The cleanest milk produced may be that which is milked by machines. Therefore, a proper knowledge of their operation and the whole technique of milking is important in the control of mastitis.

The control of mastitis, then, is a problem that requires the education of the dairyman regarding many things which he and his men must do at each milking. In addition, there are many plans relating to better sanitation and isolation which must be followed:

A FEW RULES FOR MASTITIS CONTROL

- 1) Raise all replacements if possible.
- 2) Do not allow calves or heifers of any age to nurse each other.
- 3) Feed helper calves milk from healthy udders. It may often be possible, however, to raise them on milk from diseased udders if they are not allowed to nurse themselves or each other.
- 4) When necessary to purchase cows, isolate them for thirty days and have their udders and milk examined by a competent veterinarian.
- 5) Use a strip cup before each milking to identify the abnormal secretions of defective udders.
- 6) At thirty- to sixty-day intervals, or at least once or twice per year, have a veterinarian examine the entire herd for mastitis. This should include the dry cows.
- 7) Stanchion cows that have diseased udders by themselves, and milk them last.
- 8) Before milking, wash udders with warm (110 to 125 F.) water containing 200 to 400 parts of chlorine per million. Use individual cloths for each cow, and have the cloths washed

and sterilized by boiling or steam. Keep cloths in chlorine solution between milkings.

9) Do not milk onto the floor.

10) Try to develop the proper method of milking cows with mechanical milkers by massaging or washing the teats and udders immediately before applying the teat cups, not several minutes or hours earlier. This will cause the cow to "let down" the milk more promptly and naturally.

11) Do not permit wet-hand milking.

12) Keep teat injuries clean by soaking frequently in an antiseptic, or by placing a cotton or gauze pack over an antiseptic such as 5 per cent sulfathiazole ointment. Bandage it onto the teat with adhesive tape.

13) Do not use teat or milking tubes or dilators unless the greatest surgical cleanliness is employed.

14) Do not inflate the udder for the treatment of milk fever except in dire emergency.

15) Use plenty of bedding to avoid udder injury and exposure to cold. Avoid drafts on udders.

16) Do not use lime as a substitute for cleanliness. It is best not to use lime or superphosphate or other chemicals on the standing platform. These chemicals are useful in the gutter and on the walk to the rear of the cows.

17) The platform under the cow's udder should be scrubbed clean frequently with hot lye solution or just hot or cold water and 1,000 parts of chlorine per million.

18) An infected quarter should be dealt with by treatment, by drying off the quarter completely, using chemicals to destroy the gland tissue, or by amputation of the teat. The slaughter of the cow should be advised if these procedures are not possible or advisable.

Treatment of mastitis has been improved in the last few months. It should not be forgotten that a long, dry period, with the udder completely free from secretion, does a great deal of good in some cases. Likewise, the local treatment of acute mastitis and of the common flare-up which so often occurs in chronic cases is often less damaging and more valuable than infusions. Hot solutions containing Epsom salt seem especially useful as a soak for acute cases. The removal of all exudate at one-half-hour intervals, or as often as possible, will do much good.

Infusion therapy seems to be safest and most effective after the acute stage has passed. If infusions are used in treating acute cases in lactating cows, the material should not be left in the udder for long

periods in quarters that are hot and badly swollen. Certain products may be infused with less irritation than others. If the treatment is followed by a cessation or great reduction of secretion, the chemical used was too irritating, was left in too long, or the gland was so badly diseased that it was about to stop secreting.

Present results suggest that infusion therapy is more effective if applied during the late lactation or dry period, or at both of these times. It was previously stated that any quarters that have been supposedly completely at rest or dry for a month should contain a milky or, ideally, an oily secretion somewhat like strained honey in appearance. If pus and watery material are present or the quarter is firm or hard, hot and swollen, frequent milking and infusion should be employed. Such quarters may then be rested another ten days or longer and treatment repeated if indicated. By careful and repeated application of infusion therapy to quarters that are not too fibrotic, it is possible to salvage many cows at least temporarily from the destructive action of mastitis. By treatment alone, the disease will never be put under control; but as an emergency procedure in the herds where it is necessary, treatment offers promise of greatly increasing the milk production from udders that are infected but not destroyed. Discouraging results will follow attempts to treat quarters that are too seriously diseased, but surprisingly good results will be obtained on many quarters treated while the cow is dry, or on udders that are carriers of bacteria without distinct fibrosis or atrophy. There is, as yet, no perfect treatment. This is a most interesting field for a veterinarian and one in which it is his duty to be of real service to the dairy industry.

ACETONEMIA—MILK FEVER—METRITIS

Frequently, information is requested regarding the nature of ketosis or acetonemia. These requests usually come from good breeders of high producing cattle, although in some areas this carbohydrate deficiency, or disturbed carbohydrate metabolism, occurs in cows that are poor producers or are in poor flesh.

The true cause of the disease is unknown,

but is believed to be associated with hormone production. It may lead, finally, to a fatty degeneration of the liver.

The importance of recognizing acetoneuria from the symptoms and history is obvious to anyone who has watched these cases drag along under improper handling. The usual history is that the cow had freshened from ten days to four weeks previously, has produced very well, but is now failing in appetite, condition and production. Rarely, cases occur before, during, and a longer time after parturition. Nearly all cows with ketosis lose weight rapidly. Some are very nervous, showing symptoms resembling those of bovine rabies.

The diagnosis is based on the symptoms and history plus a careful but simple test of the urine or milk for acetone bodies. This test, easily made at the stable, will often cause one to change the diagnosis from indigestion, traumatic gastritis, or even encephalitis, to acetoneuria with low blood sugar and possible degeneration of the liver.

Treatment, if applied early and repeatedly, will usually be followed by a return to normal in a few hours or days. Relapses may occur during the first month of lactation. Insulin with dextrose, dextrose alone, dried brewers' yeast, other sources of the B group of vitamins, chloral, and anterior pituitary extract are some of the substances used successfully in the treatment of acetoneuria.

Preventive measures have not proved to be entirely satisfactory. Corn sugar and molasses, if obtainable, are useful. They may be added to the grain ration for several days before and after calving.

Milk fever, a disease associated with a marked lack of calcium in the blood, is often thought to be closely related to acetoneuria. The idea has arisen, therefore, that feeding molasses will also prevent milk fever. Clinical evidence to support this belief is lacking. It is desirable to prevent acetoneuria by the use of corn sugar or molasses, or at least to decrease the severity of the disease by the use of these products since acetoneuria may be a serious complication in some milk fever cases.

A third disease that often complicates the condition in a cow that has been fresh for twenty-four to seventy-two hours is metritis. The three conditions, when present simultaneously in the same patient, often cause the cow to go down repeatedly, following treatment, during the first two weeks after parturition. A few cows fail to respond sufficiently to be able to stand. There is a possibility that hormone therapy may prove useful in preventing the severity of toxic or septic metritis. The use of some of the estrogens, alone or followed by posterior pituitary extract, often causes the uterus to develop better tone and to expel its contents. It is not known to exactly what extent hormone therapy may prove useful in the treatment of cows affected with the three conditions. Repeated injections of calcium, dextrose, phosphorus, magnesium, and even the use of udder inflation sometimes fail. As a whole, however, the results are good if the cases are observed and treated early and frequently.

Space and time make it undesirable to go into greater detail and to consider many of the other important disease problems. It is, however, the opinion of the committee that there are many important districts, well adapted to the dairy business, where dairymen need veterinary service to control the diseases we have mentioned. In these districts, more dairying could be done and the production of milk and milk products greatly increased if the farmers could be guaranteed veterinary service to protect their large investment in cattle. It is entirely possible that competent veterinarians, well trained to do the work, could be secured for such areas if their services in meat inspection and routine disease control work could be financed by the state and federal governments on a *per diem* basis. The districts where such men are needed are presumably more numerous around small towns and cities where veterinarians have not been attracted—where it would take time for such men to develop a practice upon which they could depend for a living. The problem of the placement of competent veterinarians in districts where they are most needed deserves study if the diagnosis

and detailed prevention and control of even the more common diseases of dairy cattle are to be done effectively. Many veterinarians would stand ready to support such a plan, especially in this emergency.

SUMMARY

The nutrition of dairy cattle including calves is discussed briefly, an attempt being made to point out a few common deficiencies. The close relationship between this subject and the important project of raising healthy calves is mentioned.

The foundation of a good dairy herd is based upon the successful production of more and better calves. A plan of raising such calves is described. Prevention of diseases of calfhood through proper feeding and sanitation is necessary for success. Modern treatments are of great aid in increasing the number of calves that may be raised.

Close coöperation between dairymen and veterinarians in an attempt to control breeding diseases is essential. Breeding efficiency must be kept at a high level to insure an adequate milk supply. Frequent examinations of the entire breeding unit, including the bulls, is advisable if the dairy herds are to maintain a satisfactory reproductive rate. Modern methods of prevention of genital disease, if applied by competent practitioners, will show results in an increased crop of calves and increased profit from milk. The control of trichomoniasis, by hygiene and possibly by artificial breeding, is a part of this program of handling breeding problems.

The important place that brucellosis holds in the success of the dairymen is mentioned. If this disease were eliminated, our supply of dairy products would be increased. The ideal should be to develop blood-tested, negative herds, or vaccinated, blood-tested, negative herds. All dairy herds should be subjected as rapidly as possible to one of the well-known, successful plans by which this important disease may be controlled. The program of calfhood vaccination should be given a fair and thorough trial; but the value of the blood test should not be ignored.

Mastitis is perhaps more important than

brucellosis from the standpoint of production of high quality milk. This disease can be controlled if the farmer is taught how to use milking machines and if he is willing to apply sufficient sanitary measures. Udder infusion therapy is important and, if applied carefully, will increase the annual output of milk from our dairy herds; but therapy will not take the place of sanitation, careful physical examination and elimination or isolation of cows with marked fibrosis of the udders.

A suggestion is made that large animal practitioners are needed in many districts to attempt the control of these diseases. Members of our profession stand ready to meet this and all other demands of the war emergency program.

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We are not importing any food from Britain, but we are certainly importing a lot of useful information about food which her scientists have developed. In so far as knowledge of nutrition is concerned, World War II has brought out new facts and drawn attention to old facts that will be at least one compensation for that terrifying visitation.

Here is an example of all-out support of the war. Louis J. Werling of Baldwin Township, Pennsylvania, closed up his coal business, sold his seven trucks and other equipment, enlisted in the Navy and bought \$7,000 in War Bonds with the proceeds from the sale of his business.

Education is a system of discipline leading to self-discipline. Building of character is its most important purpose. Discipline leads to good morals and good character.—*From Pathfinder.*

Swine Dysentery

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DYSENTERY in swine is one of the diseases in the group commonly referred to as enteritis. Moreover, it is one of the causes of the pathologic conditions of the intestine commonly called "necro." Bloody enteritis, bloody diarrhea, and black scours are other names that are applied to this disease. It is now apparent that there is urgent need for dividing the enteritis group of diseases into its component parts. The recognition of swine dysentery as a separate, distinct disease will help to reduce the confusion and uncertainty regarding enteritis.

Dysentery may affect swine of all ages, but is usually most destructive in young animals. The mortality varies from a few animals to almost 100 per cent of the herd. The average death loss among hogs of all ages may be expected to reach about 25 per cent. The economic importance of the disease is further increased by the stunting of a number of the animals that live.

The incubation period in experimentally produced dysentery has been observed to vary from four days to from two to three weeks. The majority of the experimental animals developed symptoms from six to nine days following the feeding of infectious material. The disease can readily be reproduced by feeding a portion of the colon or the bowel discharge from an affected animal. The specific cause has not been determined. *Salmonella suispestifer* can readily be isolated from some affected hogs, but cannot be found in others. *S. suispestifer* appears to bear a relationship to dysentery similar to its relation to hog cholera.

Symptoms and history.—The symptoms and history associated with dysentery are usually sufficiently characteristic to war-

rant a diagnosis. The disease is particularly likely to occur following the purchase of feeder hogs that have come from an infected herd, or have passed through an infected sales barn or stockyard. Infection may be brought into a herd through the purchase of breeding stock, or it may be introduced in some unknown manner from infected herds in the neighborhood. There is evidence suggesting that some apparently healthy animals that have passed through an outbreak may serve as carriers of infection.

The characteristic symptom of dysentery is a diarrhea in which there is blood and mucus in the feces. In young swine, there is usually no difficulty in recognizing the blood in the stools—"bloody diarrhea." In older animals, the blood may be so changed that it imparts a dark color to the feces—"black scours." The presence of mucus with the blood usually helps to distinguish dysentery from cases of hog cholera in which grossly recognizable blood passes from the bowels. There are doubtless some cases of dysentery in which there is nothing characteristic about the diarrhea.

Some hogs die of dysentery without having shown any symptoms that were noticed. Usually, the diarrhea is accompanied by signs of dehydration and rapid loss of weight in animals that are in apparently good condition. The flanks quickly become sunken and evidence of weakness is usually shown. Unless the weakness becomes marked, affected animals usually appear comparatively bright. The course of the disease is quite variable. Death may occur at the end of several hours, or symptoms may extend through a week or more. Emaciation commonly occurs in prolonged cases. Apparently recovered animals often show symptoms again when put on full feed.

Lesions.—The gross lesions of dysentery are limited largely to the cecum and colon.

Presented before the Section on General Practice at the seventy-ninth annual meeting of the American Veterinary Medical Association, Chicago, Aug. 24-27, 1942.

From the Department of Veterinary Science, Purdue University, Lafayette, Ind.

Typhlitis and colitis are apparently the only gross lesions that are constantly present. The stomach mucosa sometimes shows hyperemia and hemorrhage. These stomach lesions do not always occur, and there is nothing characteristic about them when they do occur. Degenerative fatty infiltration of the liver has been observed in a series of experimental animals, although it is questionable if these liver changes are a part of the pathology of dysentery.

The lesions found in the cecum and colon vary in different stages of the disease. The visceral peritoneum and the colic wall may be slightly edematous, although serous infiltration here is not very well marked. In an early stage of the disease, the entire colon and cecum often have a reddish or florid appearance when seen from the serosa side. The diverticula in the colic wall are often more or less conspicuous, appearing either as roundish, clear, hyaline areas, or as spherical, abscess-like structures.

In an early stage, the colic mucosa appears swollen, congested, and hemorrhagic. Blood and mucus are present in the cecal and colic content. The presence of the mucus helps to distinguish dysentery from the hemorrhagic colitis sometimes found in hog cholera. In later stages of dysentery, the mucosa is more or less covered with diphtheritic exudate, and the cecal and colic content often has a rice water-like appearance due to the presence of particles of material sloughed from the mucous membrane. Usually, considerable quantities of mucus and at least some blood are present even in the late stages. The pathologic process may well be called a hemorrhagic, catarrhal colitis. The same type of change found in the cecum and colon is sometimes found in the rectum.

Treatment.—In attempting to control swine dysentery, chief dependence should be placed on quarantine and sanitation. Questionable animals or those known to have been exposed to infection should be kept from having contact with healthy swine. Since the infection apparently leaves the body principally, if not altogether, in the bowel discharge, healthy animals should

be kept from contact with feces from diseased hogs. Separating affected animals and dividing the herd into as many groups as possible, putting the healthy portion of the herd on clean ground, help to control the spread of infection.

Various methods of treatment have been tried. Thus far, most of the trials have been made on a field basis. The so-called salt treatment was apparently first reported from Iowa, where John S. Koen observed its use by a farmer who had been having heavy losses from dysentery. This treatment is given by dissolving 1 gal., or about 10 lb., of salt in 50 gal. of water and then soaking oats in the salt solution. Other feed is withheld to insure consumption of the salt-treated oats. The treatment is usually not continued without interruption for longer than four or five days. After a rest period of four or five days, it may be repeated. An intestinal antiseptic is usually used in connection with this treatment. T. L. Steenerson of Indiana uses a salt treatment in which he gives, by means of the stomach tube, $\frac{1}{2}$ oz. each of rock salt and bicarbonate of soda in 1 pt. of water per 100 lb. of body weight. Whenever salt is used as a treatment, it is highly important that the hogs have easy access to an abundance of water.

There are several alkaline or alkaline and salt preparations being used for dysentery as well as for other forms of enteritis. These preparations are obtainable from firms who prepare products for veterinarians. As regards more specific chemotherapy, H. C. H. Kernkamp of the Minnesota Agricultural Experiment Station tried sulfaguanidine with promising results.

Some practitioners depend mainly or altogether upon special feeding methods as a means of treating dysentery. Usually, the method is temporarily to reduce greatly or eliminate entirely the use of ordinary feed, and to supply a bland feed such as milk and molasses.

While the treatment and management of dysenteric herds are important, the development of control measures to prevent the perpetuation and spread of the disease is

Occurrence of Ringworm Disease and Lumpy Jaw in the Muskrat in Maryland

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THE OCCURRENCE of a skin ailment of fungus origin in young muskrats was first reported briefly by Errington (1939). Results of intensive studies, conducted by this investigator in northwestern Iowa during the breeding seasons of 1935, 1936, and 1938, have been recently recorded in detail (1942), attributing this serious disease to the ringworm fungus, *Trichophyton mentagrophytes*. Of 364 litters worked with, he found 35 (9.6%) infected. In the infected litters, 98 out of 134 young—(73.1%) contracted the disease; of these, 90 (91.8%) apparently died. Incidence and severity of the infection increased as the breeding season (mid-April to late August) progressed. During the course of these investigations, both Errington and his assistant became infected in the arm and legs, respectively, by what Charles (1940), after comparative studies of culture on various mediums, concluded was the same disease as that occurring on the muskrat.

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The writer wishes to acknowledge the cooperation and assistance of Drs. Don R. Coburn and William H. Armstrong of the Patuxent Wildlife Disease Laboratory and Dr. Vera K. Charles, Mycologist of the Bureau of Plant Industry, in identifying the organisms concerned.

(Continued from preceding page)

even more significant. The farmer should be taught not to be satisfied with a mere diagnosis of intestinal "necro" in hogs, but should be urged to seek further information regarding the exact nature of the enteritis present. Traffic in infected and exposed hogs is evidently the most important way in which dysentery is spread. The most effective solution for the dysentery problem on the individual farm is to dispose safely of all infected and exposed animals and then start over with healthy animals in clean surroundings.

No mention of any such disease was made by Smith (1938) in his report of four years of investigation on the marshes of Dorchester County, Maryland. A review of the literature on diseases and parasites of the muskrat by Takos (1940) cites only the above-mentioned record.

During the present investigations being conducted at the United States Fur Animal Field Station, located on the Blackwater National Wildlife Refuge in Dorchester County, Maryland, the writer and his assistants have been continually on the lookout for any signs of possible occurrence of this disease in that state. In 1940 and 1941, a total of 16,625 muskrats was very closely handled in sexing and weighing the catch from the various trapping units of the Refuge, covering an area of some 8,600 acres. Only a single suspicious case was found and this failed to yield cultures.

Two pairs of northeastern muskrats were obtained from a breeder at West Wardsboro, Vt., on Apr. 4, 1940, and were placed in marsh breeding inclosures. One of these females gave birth to a litter of 5 young on May 11 and was caught out and transferred on June 28 to a dry holding pen. On this date, the mother was found to be heavily infected with a fungus disease as shown in fig. 1 and was immediately isolated. An application on July 1 of salicylic acid and sulfur in a vaseline base failed to produce favorable results and death occurred on July 15. A necropsy made at the Patuxent Wildlife Disease Laboratory showed a heavy infestation of the liver with both adult and cystic forms of the tapeworm, *Taenia taeniaeformis*, represented by 18 to 20 cysts, with extensive abscess formation resulting from degeneration associated with development of the cysts.

On July 28, a Maryland female and her litter of 4 in the adjoining marsh inclosure

were found suffering from the skin disease. Three of the young were infected and these were taken to the Patuxent Laboratory July 30 where an examination of the infected skin showed spores of a fungus. The 3 young were then killed and a thorough examination showed no signs of infestation

were made, but from preserved specimens submitted to Dr. Vera K. Charles we have reports of the finding of two types of mycelia, one coarse and dark, and the other hyaline and delicate like *Trichophyton* sp. The organism in this case, therefore, will probably prove to be identical with that



Fig. 1.—Lateral view of adult muskrat showing skin disease caused by the ringworm fungus, *Trichophyton mentagrophytes*, July 1, 1940.

by internal parasites. The mother and the remaining kit were isolated and dusted a number of times with sulfur. These animals eventually made complete recovery from the infection. No recurrence of this disease has been noted, and seemingly it has been eradicated at the Station by cleaning out the nest boxes and treating liberally with powdered sulfur, proper airing, and flushing out of the inclosures by flooding.

It should be noted that the first observed case of this skin disease in Maryland appeared on an adult muskrat from Vermont rather shortly after its arrival and that this muskrat was of the same race as that occurring in Iowa. Unfortunately no cul-

causing the ringworm disease in Iowa, although possibly a closely allied species may be involved.

The condition known as "lumpy jaw," or actinomycosis, was observed by the writer first in an 8-month-old, pen-raised, black female muskrat (300B) at the United States Fur Animal Station during the latter part of May, 1941. This animal had been raised in a small 8' x 8' marsh breeding inclosure, adjacent to pond edge, and transferred to a ground pen on Dec. 8, 1940. When noted, there was a large, prominent abscess on its lower jaw, and a bad case of malocclusion existed (fig. 2). Death occurred June 4. The right lower mandible was found to have the bone

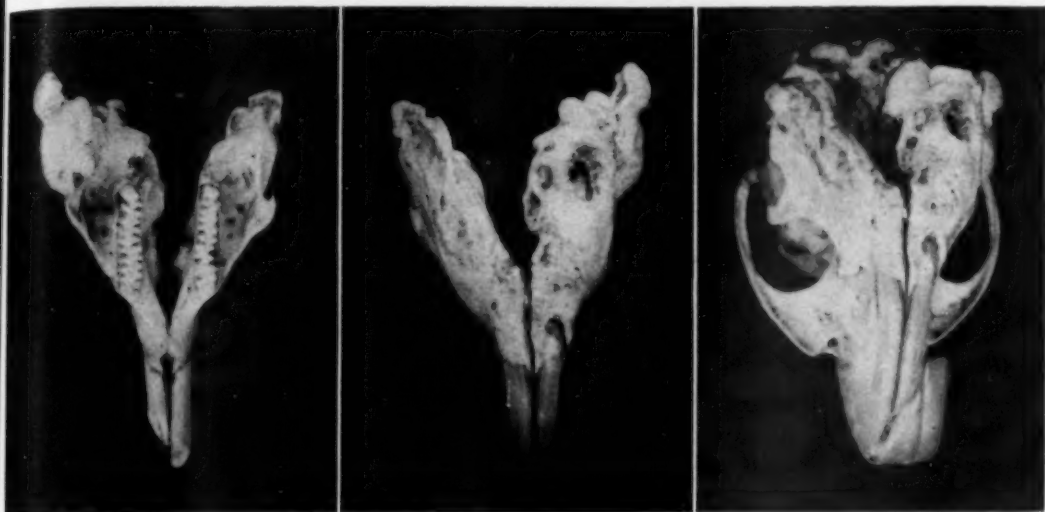


Fig. 2—Skull of an 8-month-old, black female muskrat (300 B), born Oct 7, 1940, dead of abscessed, lumpy jaw, causing bad cases of malocclusion, June 4, 1941.

greatly enlarged and spongy in character.

Early in July of the same year, another muskrat, brown female (16), was found suffering in the same way, with a bad case of malocclusion and with large abscesses under each jaw. This muskrat was over 3 years old and had been retained for over a year in an 18'x18' marsh inclosure. Death occurred on July 8 and necropsy at the Patuxent Wildlife Disease Laboratory confirmed the nature of the disease. Rosettes characteristic of the ray fungus were found in the pus exudate of the abscesses, the cheesy jaw tissue, and the lungs. The jaws were badly affected and the lower molars were loose. The lungs were also involved, being almost solid and of a pale, whitish color.

Cultures made at the laboratory showed the organism to be *Streptothrix actinomyces bovis* or the closely related *Hominis* type, since these are the only nonpigmenting types of the four clavate enlargement forms, of which this specimen was a member.

The above records are the first reported cases of the occurrence of lumpy jaw in the muskrat. It is a noncontagious but infectious disease occurring rather sporadically in domestic swine, cattle, sheep, horses, goats, and the wild elk. Mohler (1916)

states that actinomycosis is not directly transmitted from one animal to another, but is conveyed into the tissue by various foodstuffs through slight wounds of the mucous membrane of the mouth, and that the ray fungus is found in nature vegetated on grasses. In cattle, the infection is said to occur especially in animals pastured in low, swampy regions where it occasionally becomes epizootic in form. It is, therefore, not surprising that this disease should occur in the muskrat which lives in a similar habitat.

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The sale of War Bonds and Stamps is the barometer of American morale, of the spirit of '43.

The Incidence of Equine Encephalomyelitis

Abstracted from a Report (Dated March 1, 1943) by John R. Mohler, Chief, United States Bureau of Animal Industry

ALTHOUGH less prevalent in 1942 than in any year since 1936, 4,939 cases of infectious equine encephalomyelitis were reported in 35 states, of which Iowa accounted for 1,217 cases, or nearly one fourth of the total. Nebraska was second with 556 cases, Missouri third with 501, Oklahoma fourth with 377, Minnesota fifth with 319, and Illinois sixth with an even 300. The remainder were scattered. See table 1. Table 2 is a list of the states in which the eastern type, the western type, and both types were isolated from brain material, mainly of

horses, from 1930 to 1942, inclusive. Both types were isolated in Alabama, Michigan, and Texas. The disease has not been reported in Pennsylvania, Tennessee nor West Virginia since 1935. Since the virus was first discovered in California in 1930 by Meyer, Haring and Howitt, and two types (eastern and western) were soon recognized, workers of the Bureau have isolated seven strains from horse brains alone. The type of virus in 17 states remains unknown. Some of the diagnoses in these states were based upon clinical and epizootiological evi-

(See table 1 on opposite page)

Table 2. Types of equine encephalomyelitis virus found in the United States, 1930-1942*.

States from which western-type virus has been identified	States from which eastern-type virus has been identified	States from which the type of virus has not been identified	States from which the disease has not been reported since 1935
Alabama Arizona California Colorado Idaho Illinois Iowa Kansas Kentucky Michigan Minnesota Montana Nevada North Dakota South Dakota Texas Utah Washington	Alabama Connecticut Delaware Florida Georgia Maryland Massachusetts Michigan New Jersey North Carolina South Carolina Texas Virginia	Arkansas Indiana Louisiana Maine Mississippi Missouri Nebraska New Hampshire New Mexico New York Ohio Oklahoma Oregon Rhode Island Vermont Wisconsin Wyoming	Pennsylvania Tennessee West Virginia

*Viruses were recovered on one or more occasions from equines, and also in some cases from man, except in Connecticut where virus has been found only in pheasants and in Washington where it has been found only in mosquitoes.

Table 1. Infectious equine encephalomyelitis--summary of reports on incidence and mortality by States, 1942 (1)

State and division	Horses and mules in affected areas	Animals affected	Cases per 1,000 horses and mules	Total deaths	Deaths per 100 affected animals	Month of report of--	
						First case	Last case
Maine	---	0	---	---	---	---	---
New Hampshire	---	0	---	---	---	---	---
Vermont	15,482	4	0.3	2	50	July	July
Massachusetts	6,960	6	0.9	2	33	March	September
Rhode Island	---	0	---	---	---	---	---
Connecticut	---	0	---	---	---	---	---
New England	22,442	10	0.4	4	40	March	September
New York	---	0	---	---	---	---	---
New Jersey	---	0	---	---	---	---	---
Pennsylvania	---	0	---	---	---	---	---
Middle Atlantic	---	0	---	---	---	---	---
Ohio	---	0	---	---	---	---	---
Indiana	232,440	124	0.5	50	40	June	October
Illinois	402,185	300	0.7	74	25	June	October
Michigan	25,885	102	3.9	93	91	August	October
Wisconsin	238,159	74	0.3	14	19	April	October
East North Central	898,669	600	0.7	231	39	April	October
Minnesota (2)	469,812	319	0.7	49	---	April	October
Iowa	734,000	217	1.7	262	22	May	November
Missouri (2)	395,589	501	1.3	8	---	March	October
North Dakota	173,718	70	0.4	21	30	May	October
South Dakota	193,149	146	0.8	51	35	June	October
Nebraska	442,530	556	1.3	137	25	March	October
Kansas	176,725	137	0.8	27	19	May	October
West North Central (2)	2,585,523	2,946	1.1	555	23	March	November
Delaware	12,344	8	0.6	8	100	July	October
Maryland	4,000	5	1.3	5	100	August	September
Virginia	9,780	16	1.6	9	56	June	September
West Virginia	---	0	---	---	---	---	---
North Carolina	30,829	45	1.5	24	53	May	October
South Carolina	---	0	---	---	---	---	---
Georgia	7,258	5	0.7	5	100	August	October
Florida	18,446	59	3.2	51	86	May	September
South Atlantic	82,597	138	1.7	102	74	May	October
Kentucky	---	0	---	---	---	---	---
Tennessee	---	0	---	---	---	---	---
Alabama	---	0	---	---	---	---	---
Mississippi	17,776	9	0.5	5	56	January	July
East South Central	17,776	9	0.5	5	56	January	July
Arkansas	28,288	5	0.2	5	100	June	August
Louisiana	4,876	20	4.1	18	90	May	August
Oklahoma	364,589	377	1.0	114	33	May	December
Texas	180,770	48	0.3	17	35	May	November
West South Central	578,523	450	0.8	154	34	May	December
Montana	46,943	47	1.0	18	38	May	September
Idaho	16,897	140	8.3	28	20	April	October
Wyoming	83,500	91	1.1	31	34	May	September
Colorado	90,444	33	0.4	15	45	May	October
New Mexico	16,500	17	1.0	9	53	May	October
Arizona	21,845	10	0.5	5	50	May	October
Utah (2)	45,400	88	1.9	53	---	June	August
Nevada	15,939	44	2.8	13	30	June	September
Mountain (2)	327,438	470	1.4	172	31	April	October
Washington	54,102	24	0.4	11	46	June	August
Oregon	48,595	25	0.5	10	40	June	July
California	159,910	267	1.7	90	34	May	November
Pacific	262,607	316	1.2	111	35	May	November
Total or average	4,785,575	4,939	1.0	1,334	30	January	December

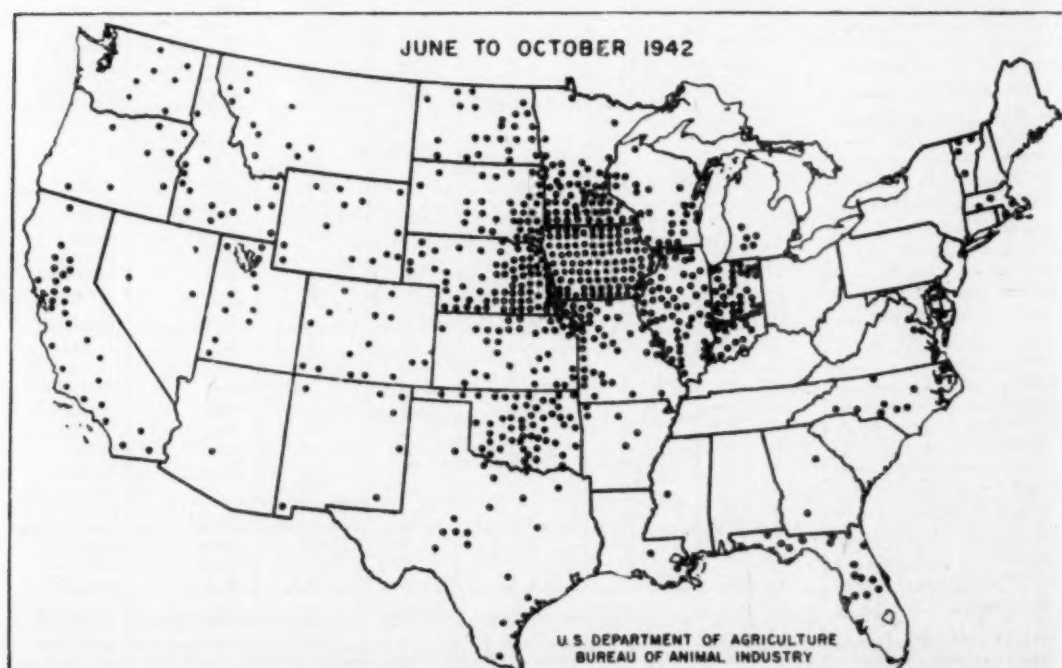
(1) Data were compiled on the basis of reports received up to February 1, 1943.

(2) In these States, data given were incomplete, and some calculations are excluded.

These maps show the distribution of reported cases of equine encephalomyelitis, according to periods, during 1942. Each dot represents a county in which one or more cases occurred during the period,



Pre-epizootic period cases reported for: January, 1; February, 0; March, 1; April, 10; May, 148.
Total, 160.



Epizootic period cases reported for: June, 237; July, 535; August, 687; September, 751; October, 491.
Total, 2,701.

dence. Effort should be made to identify the type of virus prevailing since, otherwise, vaccination, though perhaps expedient, is not scientific.

The Division of Virus Control estimates that a million horses were vaccinated with chick-embryo vaccine in 1942. Out of a group of 251,585 horses and mules vaccinated, 89 developed the disease ten days or more after receiving the second dose. The number of these vaccinated with the wrong type of vaccine is not known, although 3 of these cases in Michigan were found to have been vaccinated with western type vaccine in error. Yet, it must be admitted that some of these animals did not develop immunity when properly vaccinated with the right strain of vaccine.

During the year, laymen vaccinated an undertermined number of animals which received but one dose despite the fact that maximum protection is obtained only by giving two successive doses. Experiments have shown that the immunity obtained from repeated doses can be restored to the original or a higher level by the injection of a single dose of vaccine, months or even a year after the primary injection. However, 2 doses annually are recommended for revaccinations.

Outbreaks of equine encephalitis prior to 1930 differed from the present disease. The infection did not spread to new regions and did not occur year after year in the same locality. Since 1930, the disease has apparently become enzootic in 45 states. It is not possible to predict how prevalent the disease will become in future years. Between 6 and 7 million horses and mules have been vaccinated with chick-embryo vaccine since 1938. Undoubtedly, vaccination has played an important part in reducing the incidence of the disease, since the total represents nearly half of the equine population. The virus is likely to persist in nature until its reservoirs are eliminated or controlled.

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Saccharin Coming Back

Saccharin, the coal-tar derivative that is 300 times sweeter than sugar, was the sucrose of the European countries of World War I. Everyone carried saccharin tablets in the vest pocket. With the rationing of sugar, the demand for this sweetener is again increasing, and the public is wanting to know how much harm it is capable of doing. The answer is that its use to the fullest extent of making food or drinks pleasant to the taste does no harm.

To be remembered, however, is the fact that food or beverages sweetened with saccharin are called adulterated by the Food and Drug Administration unless declared on the label and destined for special use such as the low carbohydrate diet of the diabetic. And, tell the wife that saccharin is no good for canning. It's bitter in preserved fruit.

Publication Rules of the AVMA

Illustrations

L. A. MERILLAT

Coöperation between author and editor in illustrating manuscripts is advisable. Pictures are purposeful; they please the eye and cram the mind. Like the garnishing of dishes, illustrating pages stimulates the digestion of the contents. Printed material without illustrations is drab and more likely to be passed unread. Besides adding visual elegance, pictures improve cohesion, and give force to Theme where Vocabulary fails. Classified, the actual purposes of pictures in a veterinary journal are:

- a) to present information,
- b) to arouse interest.

Among the points useful in scoring the value of an illustration are:

- a) is it needed,
- b) does it instruct,
- c) is it technically correct,
- d) is it clear and vivid,
- e) is it interesting,
- f) might it confuse?

Because the reproduction of photographs and drawings is expensive, and the funds of a veterinary journal limited, the author should select for reproduction only those illustrations which he feels illustrate points to be emphasized. In radiographs, obvious parts should be cut out. There is a lot of redundant pictured parts in the whole skeleton of a dog occupying a page to show a spot on the pubis. The reader assumes the dog had a head, and the same reasoning goes for a spavin basking unseen amid personnel, buildings, landscape and celestial scenery. The abnormal spot, with enough healthy surroundings to bound its outline, and a good descriptive caption, serve the purpose excellently and keep down the engraver's bills.

Photographs should be glossy prints, free of all imperfections. Clips should not be used to attach glossy prints to the manuscript as they leave marks that are impossible for the engraver to eradicate. Illustrations should never be folded or rolled—they should be sent flat, and protected with cardboard.

It is desirable that the original drawings accompany the manuscript—not photographs of the drawings, as some detail is lost each time a drawing is photographed. Drawings should be made with India ink on hard, white paper, and they should be made large enough to permit reduction.

Plagiarising pictures is a grave offense, often a violation of copyrights of which the publisher may not be aware. The author or source of every picture should be shown. Repetitions not identified as such and not credited to the place where previously used are reprehensible. While these unethical practices are exceptional, they are too serious to pass over here. Pictures must:

- a) not deceive,
- b) keep within the subject,
- c) be within the reader's ability to understand,
- d) conform to page dimensions,
- e) be clearly described.

Regarding Captions and Legends.—As a rule, photographs of microscopic objects and radiographs are worth exactly nothing to the average reader unless the author takes the pains to mark or describe precisely what he wants to depict. A few darts or cross marks will increase the value of a picture and make it a more instructive one—one that will guide others in reading similar microscopic fields. As little reading matter as possible, however, should appear on pictures or drawings; therefore, letters of the alphabet or numbers should be used in the illustration, and the points to which they refer should be described in a legend under the illustration.

The descriptive captions and the explanatory legends pertaining to illustrations in a manuscript should be typewritten on a separate sheet of paper.

Contributors to the pages of the JOURNAL will recall that but few of their illustrations were ever rejected. The reason is the care taken in their preparation—for that the editors are thankful.

Chicken Brooding and Rearing Program of Poultry Conservation for Victory

The food production goals which the United States should reach this year require the utmost attention to poultry conservation measures. By permission, there is reproduced below the subject matter of the first of a series of three bulletins to be issued by the National Poultry Advisory Council, in collaboration with the Bureau of Animal Industry, U.S.D.A., as one of the steps in the Poultry Viability Program announced in the April JOURNAL, pages 258-260. The Council has authorized the printing of a half-million copies of this bulletin to be sold at cost. The bulletin is eight pages 4 x 9 inches in size, and attractively illustrated.

It is urged that a supply of these be kept at the office and some in the automobile, and a copy be given to each farmer client. Farmer clients, especially housewives who brood and rear poultry, will appreciate receiving one of these informative bulletins. They fittingly aid the poultry war effort and the best interests of the general practitioner.

The delivered prices are: 500-\$5.00; 1,000-\$9.50; 3,000-\$28.00; 5,000-\$45.00. Checks should be made out to the National Poultry Advisory Council, and sent with order to Mr. Lee Hammett, Rm. 1630, 201 N. Wells St., Chicago, Ill.

MANAGEMENT

1) *Buy Quality Chicks from Properly Pulled-Tested Stock and Order Well in Advance.*—

Inferior chicks are expensive at any price. Since late hatched chicks (July-August) often make a slower rate of gain during the hot summer months, and may not mature as rapidly as earlier hatched chicks, make every effort to obtain chicks as early as possible. Give special attention to late hatched chicks, such as avoiding overheating in the brooder house, providing adequate shade for feeders and waterers, and keeping fresh, cool water before them at all times.

2) *Prepare for Arrival of Chicks by Having Houses, Equipment, and Yards Cleaned, Disinfected, and in Readiness Before Each Brood.*—

Clean houses properly by scraping, sweeping, scrubbing, and scalding. One can of household lye to each 15 gallons of very hot water, applied to the cleaned floor, destroys coccidia and other parasite eggs. When the floor is dry, apply an approved disinfectant to floor and walls. Scrub all equipment, and if possible expose to sunshine for a day or two.

3) *Move Brooder House to Clean Ground.*—If brooder house is not stationary, move to clean ground before the chicks arrive. Clean ground is that which has not been used by chickens or turkeys, or been fertilized with poultry drop-

pings, for 2 years. This important precaution is a first-line defense against coccidiosis, roundworms and tapeworms. Do not permit chicks or pullets to mix with older stock. Do not permit visitors to enter brooder houses or yards.

4) *Provide Adequate Equipment.*—Provide a properly working brooder stove of sufficient size to care for the number of chicks raised. In the beginning, provide one chick feeder 2 feet long, open on both sides, for each 50 chicks. As the chicks grow older, increase both the size of feeders and the amount of feeding space. Supply at least one water fountain of 1 gallon capacity for each 50 chicks. Provide a solid guard ring to keep the chicks confined near the brooder stove for the first week and to prevent chilling. Install adequate roosts and encourage early roosting.

5) *Protect Feed and Water Container to Prevent Wastage and Improve Sanitation.*—Place feed and water containers on slatted or wire platforms to prevent chicks from contact with litter which may become wet or contaminated. Supply feeders constructed to prevent wastage. Do not fill feeders too full.

6) *Use a Deep, Highly Absorbent Litter and Change Less Frequently.*—Use crushed corn cobs, shavings, dry sawdust, or a good commercial litter at least 2 inches in depth. Straw alone is not a good litter and if used, either should be mixed with one of the above mentioned materials or cut into 2 inch lengths. Keep litter covered with sacks or rough building paper the first five days while the chicks are learning what and where to eat. Stir the litter frequently, at least 3 times a week, and

A program of management, nutrition, and disease control adopted by the National Poultry Advisory Council in collaboration with the Bureau of Animal Industry, Agricultural Research Administration, U.S.D.A., for the conservation of the Nation's poultry resources by improving livability.

add new litter each week until it is about 4 inches deep by the time the chicks are 5 weeks old. In the absence of an outbreak of an infectious disease, this built-up litter need not be changed throughout the brooding season. Further, a deep, dry litter reduces the chances of a serious attack of coccidiosis. Again, this method saves much labor and time and does not increase disease hazards.

7) *If Floor Space Is Inadequate, Employ Better Management.*—Use brooder house to capacity. Under average conditions provide one-half square foot of floor space for each day-old chick. If the floor space per chick is less, deeper litter, more feeders and waterers, and more attention are required. Crowding chickens often results in unprofitable pullets and unnecessary mortality.

8) *Let Chicks Out of Doors to Utilize Sunshine and Green Grass.*—During good weather, let chicks out of doors when they are 2 to 3 weeks old, and limit them to a small area of the yard near the opening, for the first few days. As the chicks grow older, place most of the feeders and waterers out of doors to encourage exposure to sunshine and to make young, tender, green feed available. Move feeders and waterers at least a few feet every few days, as a sanitary measure, and to make more green feed available.

9) *Separate Cockerels from Pullets at an Early Age.*—As soon as the sexes are apparent, place the cockerels in a separate building or room. If they cannot be separated until the pullets go to range, then at that time leave the cockerels in the brooder house and provide adequate care and feed for them to produce a maximum of poultry meat.

10) *Provide Green Pasture Range.*—Move the pullets from the brooder house as early as possible to clean range and avoid contact with older chickens, turkeys and other fowl (See recommendation 3 for definition of clean range). Provide a well-established sod range which will supply young, tender green feed for the greatest period of time until the pullets are ready to house in the fall. Cow pasture provides an excellent range for pullets, since cows keep the grass well cropped, thus making available a constant supply of young, tender green blades. Enclose poultry shelters and equipment sufficiently to prevent cows or hogs from entering.

11) *Build Range Shelters from Available Scrap Material.*—Provide range shelters and shade to protect the pullets from storms and hot weather and to permit adequate shelter at night. Range shelters may consist only of roof, roosts, and wire or slatted sides in order to confine birds at night. These can be made from scrap material available on most farms.

12) *Protect Feed and Water Containers on Range and Move Them Frequently.*—Use a sufficient number of large-size feed and water con-

tainers on range, constructed to avoid wastage, to maintain sanitation and to protect the feed from wind and rain. Place water containers on slatted or wire platforms near the feed. Move feeders and waterers a few feet once a week or oftener.

13) *Protect Pullets from Predatory Animals at Night.*—Confine the pullets to the shelters each night as a means of protection against predatory animals.

14) *Clean and Disinfect Brooder House and Move to Clean Ground Before Starting Second Brood.*—When the pullets are on range and the cockerels have been marketed, thoroughly clean and disinfect the brooder house and equipment, and move to clean ground before a second brood is started. (See recommendation 2.)

NUTRITION

Feed Adequately.—Frequently more chicks starve to death than die from disease. Use a chick starting mash of good quality. Keep a fresh, adequate supply before the chicks at all times. Avoid wastage by using properly constructed feeders, and not filling them too full. To conserve protein, provide fresh-cut, young, tender green feed daily. Provide a constant supply of fresh, clean water. Provide grit to improve feed efficiency.

DISEASE CONTROL

1) *Buy Chicks from Properly Pullorum-Tested Stock Only.*—Obtain chicks from hatcheries which conduct their pullorum disease testing under one of the three following plans:

- a) The National Poultry Improvement Plan,
- b) A State, regional, or local official plan,
- c) An effective individual plan.

2) *If Disease Occurs, Obtain an Early and Accurate Diagnosis.*—A mistake in diagnosis may result in the application of ineffective control measures; therefore, obtain an accurate diagnosis as the first step in keeping losses at a minimum.

3) *Properly Dispose of Dead Chicks.*—Remove casualties from the brooder house promptly, and completely burn or deeply bury—daily. Do not permit dogs or other animals access to dead chicks.

4) *Institute Measures to Prevent Losses from Infectious (Chick) Bronchitis.*—Do not confuse this disease with colds. Infectious bronchitis is primarily an infection of young chicks; colds seldom attack chicks under 6 weeks of age. Prevent contact, either direct or indirect, with older chicks, pullets, or hens which have been exposed to, infected with, or have recovered from infectious bronchitis. If the disease appears in the brooder house, dampen the litter several times a day to reduce dust. Increase room temperature about 5 degrees. Dampen the mash until crumbly (not wet) and feed enough

to last about 20 minutes, several times a day, to encourage eating.

5) *Utilize Proper Management to Prevent Losses from Coccidiosis.*—Use a deep highly absorbent litter. The microscopic parasite, which causes the type of this disease most commonly seen in the brooder house, is widely scattered around poultry buildings on the average farm. When relatively small numbers of these parasites are consumed, the chicks become protected from larger doses later, which otherwise might be capable of producing a serious form of the disease. Therefore, if a deep, built-up, absorbent litter is used, and not changed, and ordinary cleanliness is observed, the brood usually becomes exposed gradually to coccidiosis, and serious losses can be averted. If a shallow litter is used and changed each week and coccidiosis occurs, the bright-red, bloody droppings readily attract the chicks, and the infection may quickly spread throughout the brood, whereas if a deep litter is employed, many of the infectious droppings may become quickly buried and dried, resulting in less spread of the disease.

Use clean gravel to fill in low places around the brooder house to keep the chicks from coming in contact with wet ground which favors the spread of coccidiosis.

If the disease occurs, *act promptly!* Kill and completely burn or deeply bury those chicks which appear unable to make profitable gains. If a thin litter is used, clean the floor at once. Since coccidia are not killed by most disinfectants, it is better to "dry clean" by scraping and sweeping the floor, and then add clean, dry litter, rather than attempt to disinfect. If a deep, built-up litter is used, and the disease is diagnosed shortly after the first symptoms appear, adding an inch of new, dry litter usually will suffice. Encourage the chicks to eat. The feeding of liquid or dried skim milk, buttermilk, or dried cheese whey will stimulate food consumption. Usually coccidiosis runs its course in five to eight days after the first symptoms, and a satisfactory recovery will depend largely on the dryness of the brooder house floor and yard, and a maximum feed intake during the attack.

6) *Control Roundworms and Tapeworms by Adequate Management and Proper Medication.*—Use clean ground (See recommendation 3 under Management) as the simplest, most certain expedient to prevent roundworm infestation. Do not permit older birds to range with the chicks or pullets. Dry litter and well-drained ground near the brooder house and range shelters are exceedingly important. If the birds in the brooder house have become infested with roundworms, use a reliable treatment, change the litter the *second day after* the treatment is concluded, and move to clean ground. If chicks must be brooded or pullets reared on the same ground year after year, it may be necessary to

treat them more than once before housing in the fall.

Protect chicks from sowbugs, flies, dung beetles, and other insects. If liquid milk or wet mashers are fed, use separate containers for these feeds; wash and dry the containers immediately after each use, to discourage the breeding of flies.

7) *Immunize Pullets Against Fowl Pox in Areas Where This Disease Has Been Reported.*—Use a fully potent fowl pox vaccine (chicken strain) of reliable manufacture. Where there are no complicating diseases, vaccination should be done between the ages of 6 and 12 weeks. If the pullets are moved to range at 8 to 10 weeks of age, and are healthy, they may be vaccinated safely then, to save time and labor. The vaccination should be done by a qualified, experienced person.

Typhus Fever: Dog Tick Vectors

Typhus is widely spread throughout the world. In the United States, 2,780 cases were reported in 1941. Louse-borne cases are on the increase. The danger is greatest in military and industrial centers. Preventive vaccination is still in the experimental stage. Of 229 cases in California since 1916, there were 5 deaths. The onset may be abrupt or the symptoms may creep up for four or five days. The temperature averages 103.5 F. Headache, backache, generalized muscular aching, and rash about the fifth day are prominent symptoms. The prodromal symptoms resemble those of Rocky Mountain spotted fever which is also a rickettsia. It must be differentiated from malaria (in the tropics), measles, and the early stages of influenza. —*Abst. J.A.M.A., (Dec. 26, 1942): 1431.*

The Brazil correspondent to the *Journal of the American Medical Association* Jan. 3, 1943, reports that dogs are healthy carriers of Brazilian typhus as was previously shown for Mediterranean typhus (*fièvre boutonneuse*). The vector is the tick *Rhipicephalus sanguineus* and also *Amblyomma ovale*.

When the membership of an old and tried association grows, the aggrandizement is proof that it deserves support and is serving its purpose.

California Poultry

Since California is generally rated as a great poultry state, it is surprising to learn that poultry meat is one of its principal imports. A large percentage of poultry consumed by the Californian comes from points as far east as Illinois and Indiana, for in California poultry meat is but a by-product of egg production. The heavy layers are not a prolific source of meat poundage. The



Fig. 1—Fuller Rancho, Corona, California, raises a hundred thousand turkeys annually.

bulk of American poultry comes from Ohio, Indiana, Illinois, and Iowa. As buyers of poultry meat, San Francisco and Los Angeles compete with New York and Boston on the poultry market.

In lieu of hackneyed statistics which few trouble to remember, it is more revealing to survey poundage of poultry meat and dozens of eggs by regions. In such a study, one is not surprised to learn that the Mountain States stand at the bottom of the list. But, it may be surprising to learn that the Pacific States are next to the bottom. At the top are the West North Central, with the East North Central, South Central, and South Atlantic groups following closely on the descending scale, so far as total poultry meat and egg production is concerned. In fine, for practical purposes, the California poultry industry is not a governing factor in poultry and egg production. Its people do not claim that status. The impression that the Pacific Coast is able to supply the gourmands of the hungry East is erroneous. California is a buyer, not a seller,

of poultry and that is the reason for writing this brief. It is not difficult to find the reason for the erroneous belief easterners and midwesterners have.

It is in the number of chickens per farm and the number of eggs produced per farm that California gets its well-earned reputation as a poultry- and egg-producing center. On that score, only the small states of Vermont, Delaware, Connecticut, Massachusetts and Rhode Island compare with California which produces over 800 dozen eggs per farm. As to chickens per farm, California has over 300 as compared with the Middle-west states which have fewer than 225 per farm. To comprehend the contrast, the



Fig. 2—Poultry flocks at Fuller Rancho are bred, housed, and fed for savory capons and egg goodness.

habits of the grain farmer and the fruit farmer in regard to keeping poultry is considered. There are not many chickens in orange groves and vineyards, whereas every farmer who raises grain and livestock has a flock of chickens varying from few to many. California excels in the vastness of its poultry flocks, not in total production, and, not without good cause, it boasts of the savor of its eggs, its capons, and its turkey roasts.

Commenting on the proposed veterinary trust fund to be employed in improving facilities for veterinary education, President W. R. Woodridge remarked that while there are but 2,000 veterinary surgeons in Great Britain, twice that number is needed, besides those required for the colonies.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Three Operations Especially Useful in Conserving Cows in Wartime

T. H. FERGUSON, V.S.

Lake Geneva, Wisconsin

WHEN THE OFFICERS of the Section on General Practice invited me to present a paper at this meeting, preferably something on bovine practice, it occurred to me that they might want a discussion on some phase of surgery that we have used extensively and that has stood the test of years. Therefore, I chose three operations that have been especially useful in salvaging not only purebred animals with good blood lines for future breeding, but also grade animals for future dairying or beef.

The operations are well known and many of you, undoubtedly, have performed one or more of them. We have had occasion to perform them many times and continue doing so because the results are satisfactory.

AMPUTATION OF THE CLAWS

Indications.—When septic inflammation of the pedal or coronet joints occurs in consequence of panaritium or of injury from nails or other bodies picked up, or when extensive necrosis attacks the phalanges, amputation of the affected claw is the best treatment. The operation is not difficult to perform.

The following instruments, properly sterilized, should be at hand: a sharp, one-half-inch, round, wood rasp; a sage knife; artery forceps; a scalpel; a drawing knife; hoof nippers; a tourniquet; cotton; gauze bandages; pine tar; suturing material.

Technique.—Administer 1 pt. or more of a 7 per cent solution of chloral hydrate,

according to the size of the animal. Cast on a suitable bed with the affected claw uppermost; secure the affected foot in an extended position; clean the leg and foot from the hock or knee down with at least two scrubblings of soap and warm water; remove all manure crusts and dirt and rinse after each scrubbing with a 5 per cent solution of *liquor cresolis compositus*. Remove the hair from the ankle down by shaving, rinse with the antiseptic, and inject a local anesthetic. Examine the other claw and trim it if necessary.

Apply a tourniquet tightly above the knee or hock, and thin the horn over the lateral wall, especially at the posterior part of it, until the horny wall becomes so thin that it can readily be pressed with the fingers. The corono-pedal articulation can be felt about three-fourths of an inch below the coronary band by grasping the claw with a pair of foot nippers and moving it from side to side.

At the lowest point of the articulation, push a sharp sage knife into the joint, the concavity of the knife being directed toward the leg. Make a curved incision forward and upward to the coronary band; then, with strong flexion of the foot, aided by the hoof nippers, make a curved incision backward and upward to the navicular bone. Pass the knife between the navicular and os pedis bones and extend the incision downward, perpendicular to the solar surface and through it. The inner wall of the claw is divided from front to back. After ligating the blood vessels that can be seen,

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curette the articular surfaces of the navicular and coronary bones. Remove all necrotic remnants of tendons, ream out any fistulous tracts, and remove unhealthy granulations, leaving a clean stump.

Apply etherized iodoform, dust with boracic acid, cover with cotton and tar bandages. The leg should be inspected for swelling or other indications for removal of the bandages; if none exists, leave them on about two weeks. Recovery takes four to six weeks.

If the structures above the point of amputation are incurably involved, the digit should be amputated higher up—at the articulation of the first and second phalanges, or through the first phalanx. In the latter case, a flap operation is made.

After-treatment consists of redressing and bandaging the stump if indicated, keeping the animal in a comfortable stall with plenty of bedding, and good, generous feeding. In lactating dairy cows, it is not unusual for them to increase rapidly in their flow of milk within a few days.

CESAREAN SECTION IN COWS

We regard this operation as one of the most important and humane in veterinary surgery. It may be performed in either the standing or the recumbent position. Prior to the fall of 1940, we always performed laparotomy, choosing the side that was gravid and usually in the recumbent position. After reading about a new technique devised by E. R. Frank and S. J. Roberts, which appeared in the September, 1940, issue of the *North American Veterinarian*, we put this method to work. With the exception of one operation in the standing position, we have since used it exclusively.

Our records show that the operations have been 100 per cent successful in saving the calves that were alive when delivered, and almost 100 per cent in saving the cows. The one exception was a large Holstein-Friesian that had been worked on with block and tackle by laymen. The calf was delivered alive and is now a fine heifer about a year old. After repairing the wound in the uterus, we discovered a rent near its bifurcation that was impossible to suture satisfactorily; so, we advised the

owner to ship her to market. She was reported in good condition when unloaded in the yards.

Indications for a cesarean section in cows, naming them in the order in which they most frequently occur: (1) where the maternal pelvis is too small for the passage of the calf without traction which might injure the maternal nerves and cause paralysis or severe laceration of the vagina and vulva; (2) irreducible torsion; (3) spasm of the cervix uteri; (4) induration of the cervix; (5) ventral hernia; (6) fetal monsters; (7) vicious presentations that would require extensive embryotomy; (8) emphysematous fetus.

Never perform the operation in animals exclusively fed sweet clover for roughage; seldom, in animals that are already paralyzed by traction or have been worked on in a rough and unclean manner.

Technique.—Anesthesia by epidural block or chloral hydrate is satisfactory, if supplemented by intradermal or subcutaneous injections of procaine over the proposed line of incision.

In the laparotomy operation, shave the hair from the flank, beginning halfway between the external angle of the ilium and last rib, down about 20 in.; cast and secure the animal in an extended position; wash the skin thoroughly with soap and water, and apply a 1 to 1,000 alcoholic corrosive sublimate solution; cover the animal's side with clean moist cloths; make an incision through the skin from a point below the angle of the ilium between it and the last rib, carrying it down 15 to 18 in. The skin incision should be ample. Cover with a sterile cloth, with an opening in the center corresponding with the incision in the skin. Dip the scalpel in phenol and rinse with alcohol, or, preferably, use another sterile knife to continue the incision through the muscles. With one finger against the peritoneum to tense it, nick it with a knife and enlarge the opening with a probe-pointed bistoury. Locate the uterus and lift out the gravid horn if possible; if not, have the cow rolled on her back to facilitate matters. Make a liberal incision through the uterus wall on the opposite side of the attachment of the broad ligaments, avoiding

injury to the cotyledons. With the uterus open and held firmly by forceps or sutures, rupture the membranes so that the fluid will be expelled outside the abdominal cavity. Make an examination of the position of the fetus to ascertain the best procedure for delivery.

After delivery, examine the placenta. If fit to remove, do so; if not, apply a liberal supply of powdered boracic acid 80 per cent, and iodoform 20 per cent, into the membrane in the area of the incision. Repair the uterine wound by two or more series of continuous Lembert sutures; linen or silk may be used for the first; the other should be No. 1 chromic catgut. Suture the peritoneum and rectus muscle with the same. The external and internal oblique muscles may be sutured with No. 4 or 5 chromic catgut. Sterilized linen may be used to suture the skin and muscle. Use a figure-8 suture drawn taut and leave a 1-in. opening at the bottom of the wound for drainage. Apply a liberal coating of etherized iodoform; cover this with dusting powder or vaseline. Place the cow on her sternum with the front legs folded back, and have her kept in this position until she can get up. Place the calf near her so she can lick it; if she does not, have it thoroughly dried with straw or sacks.

After-Treatment.—Check her general condition, uterus, digestive system, and wound. Feed moderately for a week; if the bowels are sluggish, give internal stimulants and 2 qt. of neutral oil daily. When indicated, excite the uterine muscles with pituitary extract in 5- to 10-cc. doses; repeat as indicated, and stimulate the rumen with small doses of arecoline. If the placenta is retained or if there is infection in the uterus, inject liquid B.I.P.* into the uterus and check the placenta until it comes away or can be removed. Good care and after-treatment often mean recovery in complicated cases.

AMPUTATION OF THE BOVINE UDDER

Indications.—Acute gangrenous mastitis; large abscesses which eventually destroy

the integrity of the gland, causing chronic septicemia and loss of condition; pendulous udders; actinomycosis or botryomycosis of the udder.

Technique.—The udder should be thoroughly cleansed with soap and water and rinsed with an antiseptic solution. Secure the cow in lateral recumbency by stretching the front legs forward and the hind legs backward, fastened in such a way as to permit rotating to dorsal recumbency if desired. Chloral hydrate with local anesthesia is sufficient anesthesia.

Amputate the two halves separately. Make a curved incision around the half of the udder to be removed at such a point that enough skin will remain to close the wound properly. The incision should extend only through the skin into the subcutaneous connective tissue. Separate the skin by blunt dissection from the fibroelastic capsule of the gland. Locate the subcutaneous abdominal vein and a branch of the external pudic artery. Ligate these vessels with double ligatures to prevent anastomotic hemorrhage. Posteriorly, branches of the external pudic vein and artery will have to be located and ligated. Proceed upward and detach the capsule of the gland from the abdominal tunic. Near the external inguinal ring, locate the chief vascular supply of the gland, the external pudic artery and vein enclosed with the lymphatic vessel and nerve trunk in a sheath. When located, inject a sufficient quantity of either a 2 per cent solution of cocaine or butyn into the sheath, then securely ligate *enmasse*. Divide with scissors and leave plenty of stump. Without the injection of the anesthetic, this important ligation would be very painful. Turn the animal over and repeat the operation on the other half.

The wound should be thoroughly cleansed, all blood clots removed, and bleeding vessels secured. Apply etherized iodoform and pack with sterile gauze. Trim the skin to cover nicely and suture. Provide for drainage at the dependent part.

After-treatment consists of judicious feeding and attention to the wound as indicated by the temperature of the animal and her general condition.

*Bismuth Subnitrate, $\frac{1}{2}$ part; Iodoform, 1 part; Liquid Paraffin or Mineral Oil, 1 part.

Third Degree Perineal Lacerations: Perineorrhaphy

Third degree perineal lacerations in mares has always been a perplexing surgical problem—an incurable parturient accident. It occurs mainly in excitable mares of the light breeds and in first-heifer calves. First and second degree tears of this category are the more frequent in cows; third degree ones the more frequent in mares.

The exciting cause is the terrific straining of labor, delayed delivery, prolonged pressure, circulatory stoppage, weakening of the compressed tissues, leading to sloughing, necrosis and tearing. One or both legs, crossed over the head, penetrate the roof of the vagina. Untrained help and unskillful handling cause most of these accidents.

The healing of the wound inflicted is rapid and follows a well-known pattern. Cicatrization of the torn walls of the vagina and rectum forms an intimately adherent shelf extending from the vulva to the anterior end of the laceration. Cicatricial contraction and damage of the perineal structure anchor the rectovaginal shelf. Behind the shelf, the rectal wall and the sphincters retract laterally, pulled by their muscular fibers. The edges of the vaginal wound, by pulling downward and to the side, form a vault between the mucosae of the vagina and rectum. The perineum is represented by a triangular zone covered with epithelium. The gaping pudendum is produced by the forward and slightly downward pull of the retractor ani muscles. The divided ends of the sphincter ani retract dorsolaterally where they stand out prominently. After the fresh wound has healed, the lesion has the appearance of a complete destruction of the vagina and rectum throughout the length of the tear, whereas, the gaping is out of proportion to the actual tissular damage.

Reparation consists of retrieving the hidden edges and ends and restoring their continuity. Everything is there and capable of being brought together without harmful stitch tension.

The operation is performed in the stand-

ing position under the stupefying action of chloral and epidural analgesia. In excitable mares, general anesthesia is required.

The rectum is evacuated manually. Enemas are objectionable, surgical cleanliness essential. The method to pursue in separating and assembling the hiding structures to be reapposed by suturing is described and illustrated with drawings and photographs of one of the successfully treated mares.

Complete recovery was obtained in 5 out of 7 cases; in 2 cases, although the perineum healed outwardly, a rectovaginal fistula remained, due to faulty suturing of the musculofascial tissue of the rectum. Inasmuch as operations for the relief of so-called jill-flirts have been 100 per cent failures, third degree perineal lacerations in mares have been universally pronounced incurable.

Attempts to cure third degree perineal lacerations in mares immediately or soon after the unfortunate parturition were not successful. One must wait for spontaneous cicatrization before operating. [James Farquharson, *Colorado State College: Surgical Treatment of Third Degree Perineal Lacerations. The North American Veterinarian*, 24, (Apr. 1943): 220-225.]

Nutrition Conference for Veterinarians

The Third Nutrition Conference for Veterinarians sponsored by Central Soya Company of Decatur, Ind., will be held at Sunset Park, Decatur, on Wednesday, July 7, 1943. All veterinarians are cordially invited to attend.

The purpose of the nutrition conferences held by the Central Soya Company is to present timely and important information on the scientific and practical aspects of nutrition in food-producing animals, including the preparation and use of concentrates and other essential ingredients in livestock feeds. Authorities in the field of nutrition will participate in the conference on July 7. Further program details will appear in the July issue of the JOURNAL.

CLINICAL DATA

Leucocytozoon Smithi Infection and Other Diseases of Turkey Poults in Central Texas

W. C. BANKS, D.V.M.

College Station, Texas

THE PURPOSE of this report is, (1) to point out the incidence of *Leucocytozoon smithi* infection in poults in this region of Texas, (2) to concur with the recent conclusions of Johnson¹ that the asexual stage of *L. smithi* does not take place within the turkey, and (3) to indicate the more common causes of turkey losses in the vicinity of the college.

For a number of years, Prof. R. C. Dunn, Head, Department of Veterinary Pathology and Bacteriology, held autopsies on a large number of fowls. The birds were obtained from the poultry farm of the College and the Texas Experiment Station, both located at College Station. In addition, poultry raisers within a radius of 100 miles have brought or mailed birds to the department for examination. In this county, Brazos, quite a large number of turkeys are raised, with special attention to the production of the broad-breasted type. During the past year, the writer has assisted in these necropsies. The following record is for a two-month period (May and June, 1942) of examinations of poults, and it represents about 50 different flocks.

GENERAL DISCUSSION OF REPORT

The protozoan diseases, trichomoniasis, enterohepatitis, and coccidiosis, are responsible for a large percentage of the cases. A rather surprising percentage (14%) of the poults examined showed rickets.

L. smithi infection was demonstrated in

From the Department of Veterinary Pathology and Bacteriology, Texas A. & M. College.

TURKEY POULTS

Number	Diagnosis
17	<i>Leucocytozoon smithi</i>
1	<i>Leucocytozoon smithi</i> and Enterohepatitis
3	<i>Leucocytozoon smithi</i> and Trichomoniasis
7	<i>Leucocytozoon smithi</i> and Coccidiosis
21	Coccidiosis
6	Coccidiosis and Trichomoniasis
2	Coccidiosis and Enterohepatitis
2	Coccidiosis and Rickets
14	Rickets
9	Enterohepatitis
12	Trichomoniasis
3	Botulism
1	Arsenic
1	Cecitis—flagellates and cecal worms
1	Parasitism — ascarids and tapeworms
1	Necrotic enteritis (Cecitis simulating Enterohepatitis)
5	No diagnosis
Total 106	

28 birds (26.5%). Seventeen birds (16%) revealed no other type of infection. In all cases recorded in the preceding tabulation, there was a history of other losses in the flocks.

The writer realizes that the number of young turkeys examined is small in comparison to the number of birds that died. However, this report may be of value in indicating the trend of turkey mortality among the comparatively large number of

individual flocks from which the material was obtained.

LEUCOCYTOZOOM SMITHI INFECTION

A suitable blood smear from an infected bird will reveal the presence of the organisms. The organism is transmitted by the Buffalo gnat or turkey gnat, a small black fly of the genus *Simulium*. The fly is a necessary intermediate host, and attempts to transmit the infection by other means were unsuccessful. However, West² is of the opinion that lice are capable of transmitting the disease. Little is known concerning the mortality, the incidence, and distribution of the disease in North America.

THE DISEASE CAUSED BY LEUCOCYTOZOOM SMITHI INFECTION

Presence of gnats with the turkeys. Poults sick for only short time or the finding of several dead birds.—The bird would be in good flesh, in our findings of an uncomplicated case of the infection. The most constant lesions observed were: (1) subcutaneous hemorrhage in pectoral region and leg muscles, (2) mild hemorrhagic enteritis of the duodenum, (3) presence of the protozoa in a blood smear.

Giemsa and Wright blood stains were used with equal advantage. West² states that it is impossible to find the organism in the blood one hour after death, but in our experience, we had no difficulty locating the protozoa as long as a suitable blood cell smear was obtainable.

Early investigators were of the opinion that part of the life cycle of *Leucocytozoon* was spent within the erythrocyte, and the balance floating in the blood stream. Volkmar³ called these forms intracorporeal and extracorporeal bodies. Johnson,⁴ in one report, was doubtful of this fact. In a later report, Johnson¹ was convinced that the only stage in the blood stream is the extracorporeal stage. The writer is also of the same opinion, because not one blood smear examined in the two-month period revealed any intracorporeal bodies. It is suggested that the intracorporeal bodies described by Volkmar (and

others) is *Haemoproteus* having no relationship with *L. smithi*.

SEASONAL INCIDENCE

Most authors state that the incidence is highest during the late summer and early fall. In Texas, this year, the season came much earlier (May and June). With a prolonged spell of dry, hot weather, the Buffalo gnats disappeared and the poult losses, due to the infection, ceased. No treatment was attempted. Confinement to the house and a fly repellent spray were suggested as a method of reducing the incidence of infection.

Evidence is strong that the breeding flocks which are carried over to the next season are the carriers.

SUMMARY

The protozoan diseases, in general, cause the greatest percentage of losses reported in this area.

Leucocytozoon smithi infection is common in turkey poults in the central part of Texas. Apparently, the infection is the only cause of loss in certain flocks. Not a single blood smear showed intracorporeal bodies as described for this organism. Possibly, the bodies seen in erythrocytes of affected birds by certain investigators are *Haemoproteus* and bear no relation to the life cycle of *L. smithi*.

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- ⁴Johnson, E. P., Underhill, G. W., Cox, J. A., and Thielkeld, W. L.: A Blood Protozoan of Turkeys Transmitted by *Simulium Nigroparvum* (Twinn). *Am. J. Hyg.*, 27, (1938): 649-665.

In the practice of veterinary medicine where the rate of skeletal growth and body gains draws a sharp line of demarcation between success and failure, vitamin D and calcium must be thought of as therapeutic partners.

Adenocarcinoma of the Kidney in a Dog

S. W. HAIGLER, D.V.M.

St. Louis, Missouri

Patient: A black, Cocker Spaniel, male, 5 years old.

History: This dog was in an automobile accident about a year ago and suffered a fractured leg and injured hip. Recovery apparently was complete and the dog seemed normal until February of this year,

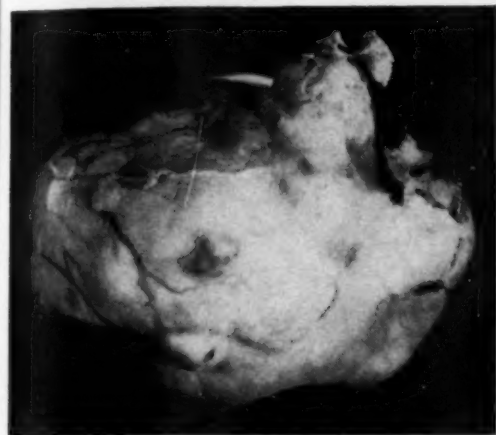


Fig. 1—Showing extrarenal hydronephrosis and tumor nodules bulging through the kidney capsule.

at which time there were periods of depression and intermittent spells of bloody urine. The patient was placed in a hospital for observation and treated at different times during the next two months. There were periods when recovery seemed complete, only to be followed by a recurrence of bloody urine and depression. X-ray and fluoroscopic examinations revealed nothing of importance. (The preceding history and information were supplied by the veterinarian in another city where the owner was living at that time.)

The case was presented at our clinic on May 15, 1942. There were depression, considerable blood in the urine, and extremely anemic membranes. There was no tenderness upon palpation. Temperature was 102 F. Urine analysis was of no value due to large amounts of blood in the urine. Symp-

tomatic treatment was prescribed for home use.

On May 21, the case entered the hospital with symptoms similar to those previously described, except that there was almost complete prostration, the patient being unable to stand. Visible mucous membranes were snow-white, temperature was sub-normal, and urine extremely bloody. Forty cc. of whole blood were given intravenously, twice daily, and 200 cc. of 5 per cent glucose solution subcutaneously, once daily. Stimulants and a hemostatic were prescribed and this procedure continued for forty-eight hours.

At this time, there was considerable improvement in the general condition, but a



Fig. 2—Kidney parenchyma largely replaced by bulky tumor and hydronephrosis.

slight enlargement of the right kidney, with considerable tenderness upon palpation, was found. There was as much blood as ever in the urine, and membranes were still extremely anemic.

An explorative laparotomy was performed and the right kidney removed. A pathological examination revealed the following:

Gross Examination.—The kidney measured approximately 8.0 x 7.5 x 5.5 cm. The

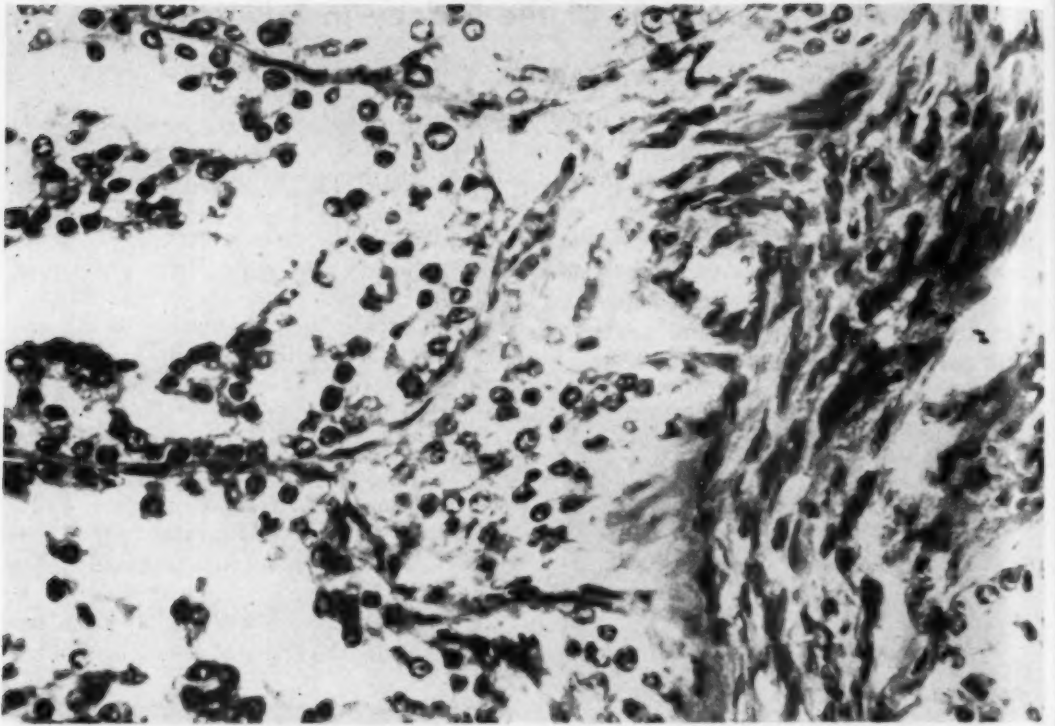


Fig. 3—Papillary carcinoma. Low power, showing papillary structure of tumor.

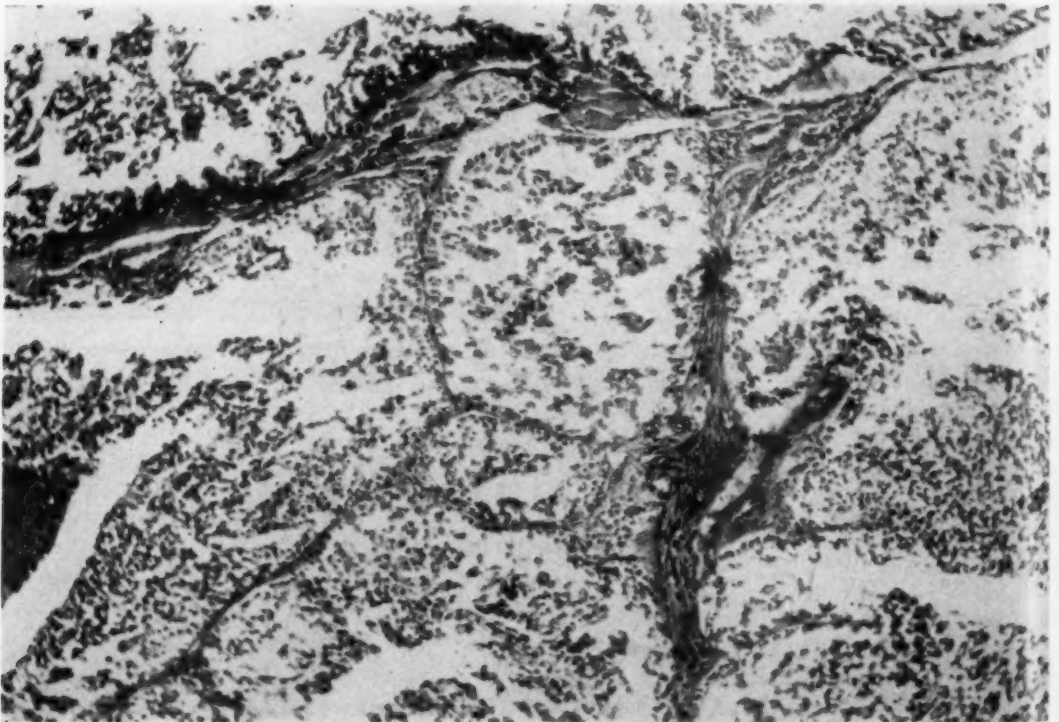


Fig. 4—High power, showing more cellular detail and some mitotic figures in tumor cells.

capsule was intimately blended to tumor tissue which had replaced practically all the parenchyma. The tumor consisted of soft, friable, grayish-white, papillary masses. A small island of uninvolved parenchyma remained at one pole. The growth extended into, but was not seen on the outer surface of the kidney capsule.

Microscopic Examination.—Almost all of the kidney parenchyma was replaced by papillary adenocarcinomatous formation. Fine, filamentous, connective tissue strands were covered in fern-like fashion with columns of epithelial cells. Almost all of the tumor was differentiated in this way, but there were a few small, solid areas, as well as a few areas of undamaged kidney parenchyma.

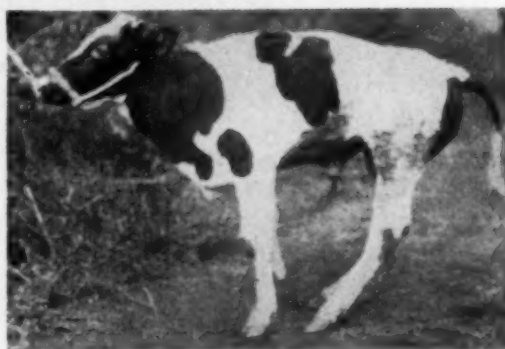
Diagnosis: Papillary adenocarcinoma.

Post Operative: In forty-eight hours after the operation, the urine was free of blood, and the patient began an uneventful recovery. He was discharged from the hospital on the fourteenth day.

Chinese Medicine

A famous Chinese physician of the sixth century, A.D. wrote: "A true doctor first finds out the cause of the disease, and having found that out, he first tries to cure it by food. When food fails he then prescribes medicine." This doctrine has lived through all of Chinese history. So much so that today one finds it hard to tell whether a store sells food or medicine. In the same shops one finds cinnamon bark, tiger tendon, beaver kidney, and sea slugs along with the ham; young deer horns along with mushrooms, dates, bamboo shoots and melons; turtle, chicken skin and cinchona bark takes the place of quinine; soups and stews replace pills and tablets. In fact, the cook book is the pharmacopeia of the Chinese doctor. Dishes designed to supply vital energy and nourish the whole body is the basis, and this is in agreement with modern medical science as it strives to determine at what point health merges into disease. Results: In China, the largest and most congested population in the world

A Study of Clinical Calcium Deficiency



—After Bechtel, Penn. State College

Fig. 1—Holstein-Friesian calf suffering from experimental calcium deficiency to the point that it was not able to stand even when assisted, owing to spontaneous fracture of both femurs. There was but little response from vitamin D but when calcium was added to the treatment, the fractures united though telescoped, as shown in figure 2.

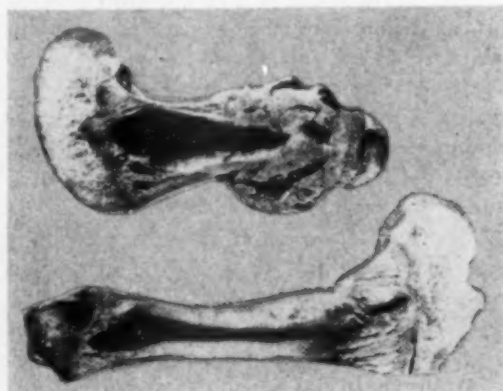


Fig. 2—Showing one of the shortened, telescoped femurs healing with a substantial callous. The length may be compared with the longitudinally bisected femur of a normal calf (below). The pictures are reproduced from the March, 1943, issue of Vitamin D Digest.

and for centuries the most contented and warless.

Smoked poultry is a specialty food product that is arousing considerable interest as a tasty morsel. Freshly dressed poultry is smoked for six to nine hours at around 110 to 115 F. As smoked poultry is perishable, it must be refrigerated, and cooked before serving.

Active Immunization of Dogs Against Leptospirosis by the Use of Formalized *Leptospira* Antigen

JOSEPH E. ALICATA, Ph.D.

Honolulu, T. H.

SEVERAL investigators, chiefly in Japan,^{1,2} have reported successful immunization of human beings against *Leptospira* infection by the use of killed cultures of *Leptospiras*. Recently, attempts were made by the writer to immunize dogs actively by the use of 10-day-old cultures of *Leptospiras* grown in Verwoort's medium (Schüffner modification) to which 0.2 per cent formalin had been added. The original cultures were obtained by the writer through the kindness of Dr. K. F. Meyer, Hooper Foundation, University of California, San Francisco. Thirty-nine out of 100 dogs, selected at random in Honolulu in a recent study,³ demonstrated leptospiral agglutinins in their serum. Reports⁴ also have shown that this disease is common among dogs in the continental United States. In localities of high incidence of the disease in dogs, immunization, if successful, could become a significant preventive measure.

Attempts were made to immunize 2 young dogs, each weighing about 4 lb., and 4 older dogs, varying from 20 to 24 lb. and about 1½ years of age. The young dogs (1 and 2) were inoculated intraperitoneally on three alternate days, each time with 3 cc. of leptospiral antigen. Dog 1 received *Leptospira icterohemorrhagiae*, and dog 2, *Leptospira canicola*. The older dogs (3, 4, and 5) were inoculated intravenously as follows: dog 3, 1 cc. *L. icterohemorrhagiae* antigen each time on three alternate days; dog 4, 1 cc. *L. canicola* antigen each time on three alternate days; dog 5, 2 cc. *L. icterohemorrhagiae* antigen each time on three alternate days. No ill effects were noted in any of the animals as a result of these inoculations. After a period of fifteen days following the last inoculation, the

serum of each dog was tested for leptospiral agglutinins, and the following titers were recorded: dog 1, 1 : 100; dog 2, 1 : 1,000; dog 3, 1 : 10,000; dog 4, 1 : 10,000; and dog 5, 1 : 1,000.

Twenty days following the last inoculation, protection tests were conducted with guinea pigs, using the serum of 2 dogs as follows:

1) One cc. of serum of dog 3 was mixed with 1 cc. of liver emulsion containing *Leptospiras*. The liver was secured from a guinea pig dying of experimental *L. icterohemorrhagiae* infection. The liver was ground and sufficient normal saline added to make a 10 per cent suspension. After the mixture had stood two hours at room temperature, it was inoculated intraperitoneally into a young guinea pig, 145 Gm. in weight. At the same time, 2 other young guinea pigs of the same weight, serving as controls, were inoculated with 1 cc. each of the liver suspension without the serum.

2) In this test, 1 cc. of serum of dog 5 was mixed with 1 cc. of known virulent *L. icterohemorrhagiae* culture (local strain). After the mixture had stood for two hours at room temperature, it was inoculated intraperitoneally into a young guinea pig, 150 Gm. in weight. Two other young guinea pigs of the same weight, serving as controls, were inoculated with 1 cc. of the leptospiral culture. In these two groups of experiments, the guinea pigs receiving the immune serum failed to become infected, whereas all the control animals died of clinical leptospirosis with jaundice. In addition, dog 4, which had been immunized against *L. canicola*, failed to show evidence of infection following an intraperitoneal inoculation of 5 cc. of saline-liver suspension made from the liver of a guinea pig dying of experimental *L. icterohemorrhagiae* infection; a young guinea pig serving as

From the Parasitology Department, Hawaii Agricultural Experiment Station, University of Hawaii, Honolulu, T. H.

control and inoculated with 1 cc. of the liver suspension died of clinical leptospirosis.

The tests described established that immunity in dogs followed the inoculation with formolized leptospiral cultures and indicated that this procedure may possibly be utilized in protecting dogs from infection. No observations were made to determine how long the immunity in dogs was maintained beyond the period indicated in the experiments.

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²Wani, H.: *Ibid.*
³Alicata, J. E., and Breaks, V.: *J. Wash. Acad. Sci.* (in press).
⁴Editorial: Geographical Distribution of Leptospirosis in the United States. *N. Am. Vet.*, 22, (1941): 729.

Notes From American Journal of Veterinary Research

(April, 1943)

The virility of bulls is lowest during the summer months. In 1,135 matings, breeding efficiency was 59.6 per cent in April and 40.8 per cent in August, and was found to be independent of sperm motility, volume, abnormality, and survival in storage.—*Phillips, Knapp, Heemstra and Eaton.*

The feeding of diets low in vitamin A for 150 to 200 days did not lead to the formation of urinary calculi in wether lambs. But wheat bran, under certain conditions, led to calculus formation. The occurrence of siliceous calculi under the conditions set up for the study was attributed to hypersecretion of urinary magnesium.—*Beeson, Pence and Holm.*

Although *Bacillus subtilis* is believed to be strictly parasitic, studies of its pathogenicity revealed that in laboratory animals, calves and sheep, inoculations produced anorexia, emaciation, organic invasion and some deaths from actinobacillosis-like lesions.—*Schweiger, Trainer and Eveleth.*

In the diagnosis of trichomonad infection in bulls, and in the application of treatment,

special attention should be given to the surface of the glans penis and the adjacent prepuce for thereon is found the greatest number of the parasites. No parasites were found in the lower urethra.—*Hammond and Bartlett.*

The severity of coccidiosis in calves, contracted in heavily contaminated quarters, was reduced with sulfanilamide given at the rate of 30 Gm. over three-day periods every other week until 150 to 180 Gm. had been given. The test calves were exposed to insanitary conditions conducive to the development of severe coccidiosis.—*Bough-ton and Davis.*

Pregnant heifers are readily infected with 5,000,000 viable *Brucella abortus* organisms instilled into the conjunctival sac.—*Hutchings and Huddleson.*

Joint diseases of horses are not caused by vitamin A deficiency, according to an experiment set up to clear the relation of vitamin A to the presence of such lesions.—*Hart, Goss and Guilbert.*

Brucella infection in swine herds can be eliminated only by removing all gilts that react in any dilution. A reaction of 1:25 is specific. The objective is a herd of gilts negative in all dilutions. The data presented is based on 10 herds with histories of abortion and sterility.—*H. S. Cameron.*

Since repeated tests reveal additional infected birds, it is not probable that a single agglutination test is sufficient to remove all infected birds from breeding flocks.—*Pomerooy and Fenstermacher.*

Sun Ssemiao, Chinese physician of the sixth century, A.D. wrote "A true doctor first finds out the cause of the disease, and having found that out, he tries to cure it first by food. When food fails, then he prescribes medicine." As the middle of the twentieth century (also A.D.) approaches one hears that a new science called *nutrition* is being clapped into the practice of medicine.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

The Phosphorus and the Fluorine Problem

A PRESENT day survey of the minerals, which are essential for farm animals and poultry, shows that we are facing a serious shortage of phosphorus-bearing supplements. This shortage is due largely to our inability to continue the importations of bone meal and other phosphorus-bearing compounds suitable for animal feeding. At

There are three important sources of this mineral which are suitable for livestock feeding: steamed bone meal, inorganic phosphates such as dicalcium phosphate, and defluorinated phosphate rock. Recent estimates indicate that less than half of the steamed bone meal needed for 1943 will be available. Efforts are being made to in-

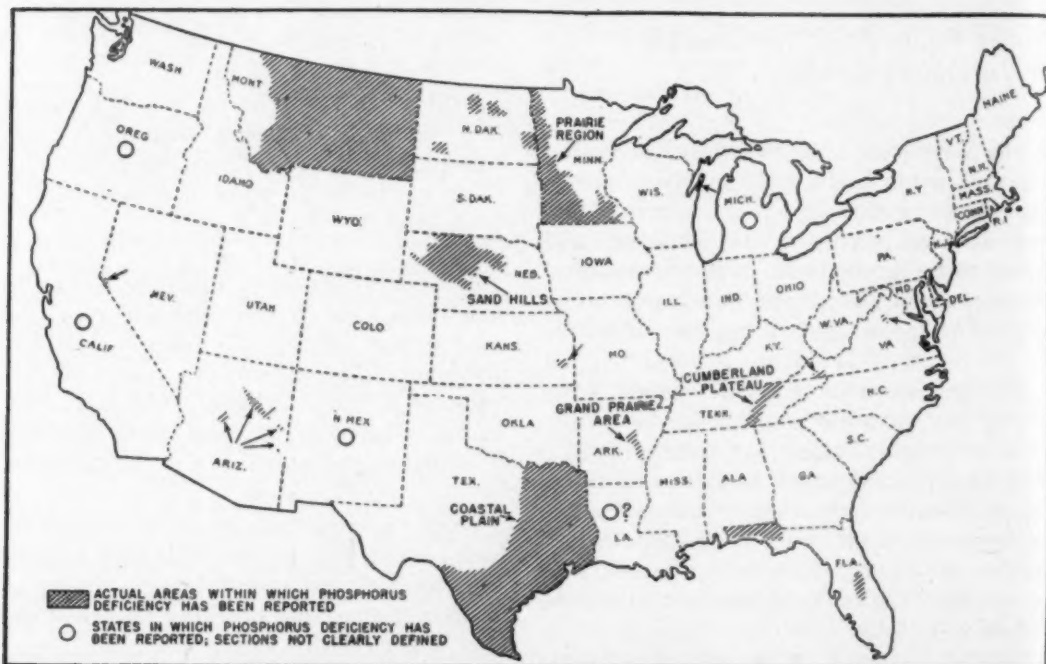


Figure 1.—Reported phosphorus deficiency in the United States. States or areas within which phosphorus-deficiency symptoms in livestock have been reported on maps or in reports submitted by the States.

the same time, a large increase in the number of farm animals and poultry has created a greater need for phosphorus supplements. To add to the difficulties, a shortage of proteins of animal origin, all of which are good sources of phosphorus, has made it desirable to add more of this element to the rations of poultry and swine.

crease the production of dicalcium phosphate but it will probably be impossible to produce enough to overcome the deficiency.

Phosphate rock would offer a cheap, readily available source of phosphorus if it did not contain from 2 to 4 per cent of fluorine, an element which is toxic for all forms of animal life. Before it can be used,

it must be treated chemically or defluorinated to a level which will make the phosphate safe for animal feeding. Some defluorinated rock is now available and recent information indicates the supply will be increased in the near future.

No one can predict, however, when the supply of safe phosphorus supplements will be equal to our needs. Until such time, we must make the best use of that which is available. Grazing animals in areas where the soils are deficient in phosphorus must be supplied with this element. Without it they will develop a phosphorus deficiency. The accompanying map* gives the location of the most important of these areas. The following excerpt from the 1939 Year Book of the United States Department of Agriculture, "Foods and Life," page 586, gives the following picture of phosphorus deficiency in cattle:

The effects of phosphorus deficiency on dairy cattle have been much studied in the phosphorus-deficient areas of the world. They consist of loss of appetite, often combined with an abnormal craving for unusual foods. The fertility of the cows is much reduced, owing to their failure to become pregnant when bred, and their milk yield is also reduced. In severe cases, the mineral matter of the bones is depleted and fractures occur frequently. In less severe cases, the phosphorus content of the blood is reduced and this may be used as a diagnostic sign of the condition.

While the grains fed to swine probably furnish enough of this element to prevent the appearance of deficiency symptoms, the failure to supply additional phosphorus to pigs which are fed the emergency wartime rations may result in retarded growth. Likewise, the grains care for a large proportion of the phosphorus needs of laying hens, but the addition of a phosphorus supplement to the emergency rations increases egg production. The grains fed to dairy cattle meet their requirements for this element except in cases of extremely high production. One large, feed-mixing concern in the east is not now adding phos-

phorus supplement to its dairy rations. This may be the first step in a movement which will eventually lead to distribution of the available supply of safe phosphorus supplements where they are most needed.

Whenever a shortage develops in any line, it is the common practice to seek a substitute. Unfortunately, substitutes for phosphorus supplements may lead to trouble. A case was cited in the Nutrition Section of the April, 1943 issue of the JOURNAL in which the substitution of ordinary bone meal for steamed bone meal introduced anthrax into a herd. Blackleg could be brought to a farm in the same manner.

There is also grave danger that raw, fluorine-bearing rock phosphate may find its way into mixed feeds and mineral mixtures. Reputable concerns are well aware that such a practice would lead to fluorine poisoning of the animals to which these mixtures were fed. Small concerns that maintain no research departments may be unaware of this danger. Livestock and poultry men, who have been taught to add a phosphorus supplement to their rations, may turn to raw, phosphate rock as a source of phosphorus. A case has recently come to the attention of the Committee in which a poultry man was doing this very thing.

A recent publication by the Committee on Animal Nutrition of the National Research Council, "The Fluorine Problem in Livestock Feeding," by Dr. H. H. Mitchell, presents the following facts regarding fluorine poisoning.

The Symptoms of Fluorine Poisoning.—"Most of the fluorine ingested by animals is deposited in the bones and teeth, the fluorine content of which increases in proportion to the amount and duration of the intake." The continued intake of fluorine finally leads to the saturation of the bones and teeth so that they are no longer able to absorb this element from the blood and tissue fluids. It is then that the toxic effects of fluorine become apparent. This latent period may be as long as a year or more, depending upon the percentage of fluorine in the ration.

Clinically, chronic fluorosis may be noted by impairment of the appetite. A careful

*From "Deficient and Excess Minerals in the Forage in the United States," by A. M. Hartman, United States Department of Agricultural Year Book, (1939): 1029.

examination of such cases may reveal the characteristic changes in the teeth and bones. "The teeth, particularly the incisors, become pitted and eroded. The molars become abraded and the uneven wear seriously hinders mastication. In some cases the pulp cavities are exposed and this leads to reluctance by the affected animals to drink cold water."

The bones become chalky white. The diameter of the cross section of the long bones is increased. Exostoses are frequently found on the long bones and the mandible, which either occur as isolated out-growths or a complete superficial covering of porous white bone of high fluorine content. In pigs, the width of the dental arch is increased.

"The fluorine content of the soft tissues also will increase, even on very moderate levels of dietary fluorine, and eventually these minute accumulations may induce degenerative changes in the kidneys, liver, adrenal glands, heart and central nervous system. The reproductive organs are among the tissues less sensitive to fluorosis, while milk production and egg production are apparently adversely affected at first only in proportion to the impairment of appetite."

Dr. Mitchell suggests the following as safe levels of fluorine for animal feeding. The permissible fluorine tolerance for mineral mixtures would seem to be 0.10 per cent for swine, 0.20 per cent for sheep, 0.13 per cent for cattle and about 0.25 per cent for chickens. As mineral mixtures are usually added to the rations of farm animals, this would supply fluorine at the rate of about 0.003 per cent of the total dry ration of cattle, sheep, and swine and 0.015 per cent of the ration of poultry.

When it is considered that raw, rock phosphate may contain as much as 4 per cent of fluorine, it is apparent that the use of small amounts of this source of phosphorus may lead to disaster. According to Dr. Mitchell, mineral mixtures should contain no more than 2.9 per cent rock phosphate (3.5% fluorine) for swine, 5.7 per cent for sheep rations, 3.7 per cent for cattle rations and 7.1 per cent for chicken rations.

Livestock and poultry men should be in-

formed of the danger of using feeds or mineral mixtures which contain phosphate rock which has not been defluorinated. They should under no consideration purchase mineral mixtures or feeds to which phosphorus supplements have been added unless they are certain that a safe source of phosphorus has been used. Where rations are home mixed, it is better to leave out the phosphorus supplement than to use ordinary bone meal or a phosphate rock. The fact that flourine is an accumulative type of poison makes it appear to the feeder that the rock phosphate is probably alright to feed. After the symptoms of poisoning appear, it is too late to do anything.

If a mineral supplement or a mixed feed are suspected of containing phosphate rock which has not been defluorinated, the sample should be submitted for consideration to the state feed control laboratory.—*From the USDA (1939) Year Book.*

Effects of Undernutrition

(An Excerpt)

Undernutrition is the result of either quantitative or qualitative deficiencies in the ration, or both, or failure of the ingested food to become available to the body. The effect of dietary deficiencies on an animal depends on a number of factors, chief among which is the nature of the deficiency—age and kind of animal, and whether it is producing or nonproductive; duration of the deficiency, and whether or not the animal has stored the missing essential nutrients from previous adequate nutrition. A long-continued deficiency of vitamins and minerals usually leads to the development of the so-called nutritional diseases. A deficiency of other factors, such as a moderate energy or protein deficiency, tends to retard growth but is not particularly harmful if not continued too long, especially if the animal is neither pregnant nor expected to produce efficiently. The body has considerable ability to repair itself and resume growth if normal nutrition is established after a period of deficiency, but a shortage of certain nutrients can cause irreparable damage and must be avoided. [Louis L. Madsen; *Yearbook of Agriculture. (1939): 446.*]

Legume Hay for Swine

Experiments conducted for six years at the U. S. Department of Agriculture, Beltsville (Md.) Research Center, have shown that good-quality, home-grown legume hays, formerly considered too bulky for hog feed, may be used to reduce the amount of concentrates required in rations for growing and fattening pigs. Of three legumes tested, ground soybean hay gave the best results, when used as 5 to 10 per cent of the total ration.

In the experiments, Virginia soybeans, *Lespedeza sericea*, and alfalfa were tested as replacements for concentrate feeds in hog rations. When used as 10 per cent of the diet, 36.8 lb. of ground soybean hay saved 52.1 lb. of concentrates per 100 lb. of weight gained. More rapid gains occurred on the 5 to 10 per cent levels than when the ground hay made up 15 to 20 per cent of the diet. Results of the tests are reported in the publication AHD-60, "The Value of Ground Legume Hays in the Rations of Fall Pigs," available from the Department of Agriculture, Washington, D. C.

Wheat Bran

Wheat bran is one of the most useful of livestock feeds. It contains between 15 and 16 per cent protein, about 5 per cent fat and only about 10 per cent fiber. While it is low in calcium, it is one of the richest sources of phosphorus of all common animal feedstuffs, containing about 1.3 per cent of this mineral. While this is about only one tenth of the phosphorus content of steamed bone meal, the use of some additional wheat bran in a ration will help, to a certain extent, in supplying this essential mineral.

Our choice is to keep the front lines across the ocean, or stand aside and watch the enemy invade our own territory.

The government is advertising for potential meat inspectors. Only farm boys not engaged in livestock, dairy, or poultry farming need apply, the advertisement states.

Soybean Meal for Poultry

Poultry nutrition specialists have found that soybean meal properly cooked in process of manufacture is a promising substitute for meat scrap and other protein feeds of animal origin. This new light on poultry feeding comes at a time when a shortage of animal-protein feedstuffs is causing difficulty for poultrymen.

For the guidance of poultrymen in compounding diets containing vegetable proteins as the chief or only source of protein, the Department has prepared a mimeographed publication, "Wartime Feed Mixtures for Poultry" which may be obtained on request from the Poultry Nutrition Laboratory, Beltsville Research Center, Beltsville, Md.—From the United States Department of Agriculture.

The Vitamin Content of Animal Feedstuffs

The kinds and quantities of vitamins present in a large number of livestock feeds are given in a new publication, "The Vitamin Content of Animal Feedstuffs." Practically all common livestock feeds are represented. The tables also show the vitamin contents of different parts or forms of the same plant. Copies of the publication, AHD-61, are available on application to the Department of Agriculture, Washington, D. C.

This is the beginning of the dandelion season, the season which brings to the table of the wise a leafy vegetable rich in vitamin A and four times richer in vitamin C than lettuce. The relish of the pioneers for dandelion is now understandable.

Butterfat, besides being the most digestible of all fats, contains a growth substance in addition to vitamin A, according to tests on rats made at the University of Wisconsin.

With lumber scarce, western farmers are turning to adobe block for building chicken house, sheds, etc. Adobe blocks are made of home-made native clay.—*Pathfinder*.

EDITORIAL

The World's Food Problem

The founding of the United Nations Food Board—UNFB—representing 34 sovereign nations brings food to the top of wartime and postwar planning, not as a political football of agrarian bureaus, but to find ways and means of preventing starvation, hunger, and malnutrition from writing the white man's epitaph. A large proportion of the world's white population is endangered; whole nations are being deliberately starved by the Axis powers to make them helpless before their inhuman conquerors. The approaching crisis is measured by impotent millions yielding to the power of hunger.

Famines and plagues are not strangers to European and Asiatic peoples; they are strangers only to the Western Hemisphere where the heritage of abundance never completely defaulted. The food situation of Poland, Greece, Holland, Belgium, and France defies analysis. The caloric intake in these countries is far below the survival level, according to authoritative information. And, never to be forgotten, is that we, too, are under-nourished. Capable dietitians have calculated that a considerable percentage of American people go on trying to cheat the graveyard on the sow-belly-hominy type of ration. The protective foods—meat, milk, fruits, and vegetables—required to make up a reasonably well-balanced regimen either are not sufficiently available to, or properly utilized by, the masses, or they are spoiled in nutritive quality in processing or cooking.

In short, the food problem is challenging the resourcefulness of the statesmen for the first time in this particular period of the world's history. That food is helping to fight the war and will help to write the peace is no longer a wartime slogan to excite the patriotism of the food producer.

Food is a stern issue that is sealing the fate of the white man's civilization. Food, where it rates as a world issue, has been taken from the feedlot, the dairy barn, and the potato patch to the conference table of the troubled diplomats, and we who labor in that field, with knowledge of its pitfalls, are bystanders wondering whether they really understand the subject of their profound conversations. They speak of famine and plague, absolutely unaware that famines and plagues of man are but the sequels of the famines and plagues of livestock. Comprehension of the fundamental need for insuring the health of domestic animals, vulnerable sources of man's main nourishment, never penetrates these august conferences, if reports of them are taken as the criterion. There's no end of conversation on the relief, the rehabilitation, and the reconstruction of agriculture as levers of peace, but not a word on the ever-existing danger of animal diseases taking the whole war effort headlong to defeat. The one menace that brought defeat to all military leaders from Julius Caesar to Robert E. Lee is yet to be impressed upon the minds of the diplomats—its name is disease of animals with famine and plague trailing with certainty in its wake. Hitler started to check that menace ten years ago when he put a veterinarian in his cabinet. If the UNFB has any intention to study the part veterinary science plays in providing food for a starving world, the gesture remains unnoticed.

Now is the time for every veterinarian to know all that is known about pullorum disease and coccidiosis of the barnyard fowl.

Keeping Well in the Near East

ARID DESERT countries bordering upon the Red Sea, Persian Gulf, and the Eastern Mediterranean Sea and towns 6,000 or more years old, recalling Biblical names of the early post-Deluge era, are occupied by American troops little heard of at the present time save in the inner circle of the global military operations, especially of the flyers in their 35-hour trips to the South Pacific theater. A recent issue of the War Department publication *Know Your Job* contains a classical article titled *How to Keep Well in the Middle Eastern Theater** which gives directives on the handling of the maladies prevailing in that sector. The Veterinary, as well as the Medical Corps, is concerned with diseases the author points out in his treatment of that important theme. The prevalence of tuberculosis and brucellosis of cattle, the part played by the contamination of raw milk, polluted water, filthy habits of the natives, and the relation of these to the duties of the Veterinary Corps written in and between the lines of this article speak well for the alertness of the Air Corps which is writing brilliant pages into American history. The diseases found in the text and arranged alphabetically for convenience are:

athlete's foot	pneumonia
chancroid	relapsing fever
cholera (Asiatic)	sand-fly fever
cobra bites	schistosomiasis
dengue	sun stroke
desert sores	syphilis
dysentery	tuberculosis
fièvre bouteneuse	typhoid fever
gonorrhea	typhus fever
heat exhaustion	undulant fever
malaria	yellow fever (threat)

Fly-borne and water-borne diseases are problems. Sharks in the sea, the blood flukes of inland waters, and scarcity of water make bathing difficult and hazardous and the drinking of water a menace to health. Natives drink water running in the streets that is contaminated with sewage. A mouthful may be sufficient to break

down the best immunity conferred by typhoid vaccination. The drinking of untreated water or bathing in water not declared safe by the Medical Corps has to be prohibited. As few precautions are taken to dispose of human excrement and garbage, flies are obnoxious pests. The stench from these insanitary habits is not soon forgotten, let alone the dangers lurking therein. Yet in the midst of this Golgotha of pests, the health measures rigidly enforced make living relatively safe for those who obey them, thanks to medical science. Notable among sanitary measures are:

- a) Drink only chlorinated water.
- b) Avoid swimming and bathing in unsafe waters.
- c) Examine the body for ticks and promptly remove them.
- d) Disinfect thick-skinned fruit in boiling water and vegetables by thorough cooking.
- e) Follow the specified directions on the prevention of fungus infections (dhobie itch and athlete's foot).
- f) Examine clothing for cobras before dressing. There may be one in your shoe or dresser drawer or lurking on the floor when you get out of bed. See the doctor at once if bitten, or follow the directives given.
- g) As the heat is torrid, travel mostly at night and don't forget your first-aid kit. The prompt treatment of wounds, burns, and abrasions is imperative. Neglected wound infections are grave. Treat the insect bites.
- h) All women are deadly—prostitutes and pick ups. They are liberal in passing along their gonorrhea, syphilis, and chancroid, and, being a Christian, you might get killed for playing around. Moslems habitually castrate Christians caught with their women folks.

Being American, the tick transmitter (*Dermacentor andersoni*) of Rocky Mountain fever (the rickettsia herein called fièvre bouteneuse) is no stranger to you, but you will be interested to know that the lighted butt of a cigarette applied to its bloated belly will make it change its mind and let go. In a soldier's outfit, cigarettes are not as scarce as kerosene.

If overtaken by thirst and scarcity of

*Brig. Gen. David N. W. Grain, The Air Surgeon: How to Keep Well in the Middle Eastern Theater. The Air Force, Official Service Journal of the U. S. Army Air Forces (April, 1943): 33-35.

water, a few tricks will help. Swish small sips around the month to alleviate the craving for water, swallow small amounts slowly, and avoid sweating, chewing tobacco, and smoking. Chew gum. A man can get along without serious consequences on a quart of water a day for four or five days, if he knows how to use what he has.

Of all these diseases to which soldiers of the Levant are exposed, ubiquitous, world-wide malaria accounts for the greatest amount of sickness and the greatest number of deaths. Warding off mosquito bites by screening (house, tent, bed, head), staying indoors at night, and protecting the arms, hands, legs, and head with clothing (head nets, gloves, boots), the use of mosquito repellents, and staying out of towns where infected inhabitants are reservoirs of the parasite are set down as important preventive measures. Mosquito control, though attempted, is a task promulgated but incomplete, as in all parts of the world exploited by civilized inhabitants.

The operations of the Air Corps involve strict regulations on fumigation and vaccination which will prevent these rapid flying "fowls of the air" from spreading to the four winds from isolated nesting places. In the vigilance of applied medical and veterinary science lies the hope that World War II and future wars will not bring about visitations of medieval plagues which practically depopulated vast areas of the earth.

The temperature may be 30 below and walrus hunting may be a trying ordeal, but Alaska's Eskimos not only are raising Red Cross funds, sending their men into the armed services, and standing watch as air raid spotters, but they are 10 percenters, too. Howard Cameron, teacher, recently evacuated from the Aleutian Islands, reports that the Eskimos are setting aside part of their income for War Bonds.

Cheese dehydrated to a flour-like powder resembles processed cheese when mixed with water.

Machinery gives us our peacetime plenty and our wartime arms, says *Nation's Business*.

A Wartime Veterinary Decree

The following document addressed to Marshal Pétain by Secretary of Agriculture Caziot of "Vichy France" is a reminder of one of the functions of the Procurement and Assignment Service set up for the veterinary profession in the United States:

Mobilization called to the colors a large number of veterinarians whose clients were left without their services. Some of these veterinarians, prisoners of war or evacuated, have not been able to regain their former residence.

In this situation some veterinarians not mobilized, or free, were able to take over their colleagues' clientele, thus rendering incontestable service to agriculture temporarily deprived of their usual veterinarians.

It would appear contrary to equity that these practitioners, who conserved a situation acquired by the absence of their confrères, should dispossess them of their sole means of livelihood.

Analogous observations should be presented in regard to persons authorized to practice veterinary medicine by virtue of the law of 1938 (Art. 6).

It seems, therefore, indispensable to have the administrative authority resolve the conflict to which the situation may give birth.

Moreover, analogous protective measures were edicted by the decree of Sept. 9, 1939 in favor of the mobilization of commercial, industrial, and mechanical professions, and of the doctors of medicine.

The object of this decree is to extend to veterinarians and the precited professionals protection so opportunely edicted in the text of regulations recalled above.

Will you, Monsieur the Marshal, accept the assurance of our respectable devotion.

s/ Pierre Caziot,
Secretary of Agriculture.

The situation portrayed in this document of fallen France forecasts conditions in our vast livestock industry which the American Veterinary Medical Association has set out in earnest to prevent through its participation in the nation-wide Procurement and Assignment Service for specialized personnel.

In regard to usurping the practice of veterinarians who go to the armed forces, the civilians left behind have a fine point of

From *Revue de médecine Vétérinaire* (Toulouse), xcii (Jan.-Feb. 1941), p. 47. Title ours.

ethics to consider when the war is over, regardless of the indispensable service to agriculture they have rendered "for the duration."

There is dual homage in the Secretary's memorandum which veterinarians will understand: their function as well as their regard for one another's personal interest is important. There is human interest in the latter which, coming from a high functionary of a nation in deep despair, shows that "liberty, equality, fraternity" is still alive and that France is far from being a decaying commonwealth.

Tinkering with the Veterinary Service is Sabotage

The retail druggists, whom we believe are the same professional gentlemen we have always known them to be, are being urged by at least two journals of the drug trade to virtually sell the country's security over their counters. Since in the legitimate veterinary circle, food is Implement No. 1 in the prosecution of this or any other war, the proposal to develop a gigantic system of quackery on American farms has to be named for just what it is—a scheme to grab money while the enemy is sneaking up. On that hypothesis, the drug trade surely took the right moment to launch its deadly program. Someone ought to tell the editors of these drugtrade journals that they are misleading their subscribers and their advertisers. Diseases of farm animals are well in hand all over the country and having been kept that way for many years is the reason for the abundance the American people enjoy. So, what except deliberate sabotage of an indispensable industry could explain this sudden outburst which, obviously to get momentum without delay, is predicated upon the expressed and only argument that there is a lot of money to be made by getting into the "veterinary business" in this 167th year of American independence.

Under ordinary conditions, the scheme would be just a laugh. Farmers are not fools, nor are the food industries which depend upon the healthy live stock which

the veterinary services have safeguarded all these years. These, like the veterinarians who live close to the livestock industry, have to look askance at the "big idea" that has just struck certain elements of the drug trade. Just now, however, while the whole veterinary personnel is organized to watch in every nook to see that no harm comes to Implement No. 1, the proposal is regarded as something worth classifying. What could be finer for Hitler, Hirohito and Mussolini than to dislocate the American veterinary service?

There is a military, as well as a moral issue involved in meddling with the nation's food supply just now. There is no justification for money-making changes in the food-production field, and certainly plenty of dynamite in the quackery proposed.

Veterinarian—the Biologist

The veterinarian is a biologist engaged in the greatest of human enterprises—providing human sustenance of the right sort and the right amount. In this work he deals with living things and their postmortem uses. His combined work in micro- and macrobiology (pathology and food industry) has made veterinary science an advance guard of this civilization.

Though biologic studies have always ranked high in the progress of man, it was only in recent decades that biologists succeeded in making possible the rapid development of modern society. From Linnaeus, the biologist (1709-1778), to Pasteur, the biochemist (1822-1895), is the period that marks the birthtime of applied biology. Before Linnaeus had classified living matter, biology could not advance step by step toward its objectives. Linnaeus is immortal because his keen sense of observation among living things led to the systematic study of structure, of function and of the biomechanism, which explain the nature of plants and animals. The chain led to the application of biology to medicine, to nutrition, to farming, to animal production and to manufacture, and thus made possible the multiplying of populations and their survival. Biologist Linnaeus and Biochemist Pasteur mapped out the path not only to

the practical suppression of disease, but also to the other branches of science indispensable to modern life. Through their type of work the specter of famine and pestilence was banished. The production of food was increased, its preservation and storage improved and its composition determined. Physics, chemistry, physiology and such sidelines as endocrinology, genetics and immunology aided in integrating the greatest of human efforts—the production of wholesome food in ample amounts.

In all times, biology has seemed to lag. Its road is a difficult one to travel. Dealing with the inner structure and function of the living cell is dealing with complex phenomena that are not as easily controlled experimentally as non-living matter, but in spite of its obstacles biology has become the main power behind the advance of the human race. Being a part of that power is the assurance that veterinary science will hold a high place in the game of life.

Infantile Paralysis

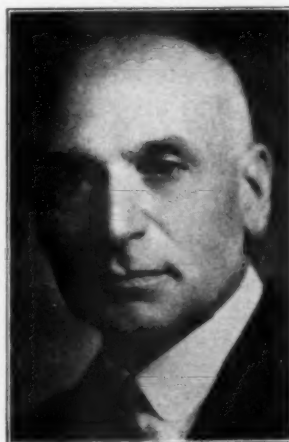
Infantile paralysis or poliomyelitis is a disease of the human spinal cord, more specifically, of the neurons of the ventral column (=motor column) of the affected side, which happen to be attacked by the specific virus. The muscle fibers innervated by the affected neurons paralyze, degenerate, and finally disappear. As is always the case in gravely injured nervous tissue, there is no chance whatsoever of rehabilitation, that is, a physically injured nerve cell is forever injured. Nerve-cell regeneration is nil. Infantile paralysis is, therefore, incurable. Massage, friction and hot-water packs (Sister Kenny's treatment) prevent atrophy or disuse of adjacent muscle fibers or bundles of fibers, but the fibers directly affected yield to no manner of intervention. The extent of disability corresponds, mathematically, to the extent of the central injury—to the neurons the virus destroyed. There is no comparable disease in animals from the physiologic, pathologic or symptomatic point of view.

Retirement of Dr. Cameron

Dr. A. E. Cameron of Ottawa, Ontario, retired in March as Veterinary Director-General of Canada, a post which he had held since 1939.

Dr. Cameron received his veterinary degree from Ontario Veterinary College in 1908. He soon afterward became an inspector for the Health of Animals Branch, Dominion Department of Agriculture; he succeeded Dr. George Hilton as director in 1939.

Dr. Cameron was admitted to the AVMA in 1913 and has been a colorful and active figure in the Association for the thirty years of his membership. He has represented District I (Canada) on the Executive Board since 1932, having been reelected last year for a third five-year term. This



A. E. Cameron

continuous record is equalled only by his predecessor on the Board, Dr. George Hilton, who represented Canada for the fifteen years from 1918 to 1932, inclusive.

Dr. Cameron has had a distinguished career both in civil and military life. He served in the Boer War and in World War I, was awarded the Military Cross for valor and other service medals. His many friends on this side of the border and across the seas join his Canadian colleagues in wishing Dr. Cameron and his gracious wife the full enjoyment of a well-earned retirement.

CURRENT LITERATURE

ABSTRACTS

Sulfaguanidine in Cecal Coccidiosis of Chickens

Two experiments involving 267, 11-day-old Rhode Island Red chickens were conducted. In each experiment, the birds were divided into 3 equal groups. Those of group 1 were fed 0.5 per cent sulfaguanidine in the mash for three days before and fourteen days after being placed on litter contaminated with oöcysts of *Eimeria tenella*; group 2 received no sulfaguanidine; group 3 served as uninoculated controls. Birds of groups 1 and 2 were kept on the contaminated litter for six weeks. The mortality resulting from the initial exposure was as follows: experiment 1—group 1, 10.2 per cent; group 2, 57.1 per cent; experiment 2—group 1, 0.0 per cent; group 2, 22.5 per cent. On the thirty-eighth day of the test, all the birds were artificially inoculated in order to ascertain the degree of resistance acquired by them. Following the final inoculation, there were no deaths and few clinically affected birds in groups 1 and 2; but in group 3, all of the birds were markedly affected, with a mortality of 24.5 per cent in experiment 1 and 12.5 per cent in experiment 2. Necropsies were performed on all survivors a week after the final inoculation. The extent of gross lesions demonstrated that groups 1 and 2 were very resistant and group 3 highly susceptible. The data indicate that 0.5 per cent concentration of sulfaguanidine in the mash was sufficiently high to be of value as a prophylactic for cecal coccidiosis, yet not so high as to interfere with the acquirement of an effective resistance to the disease. [R. W. Allen and M. M. Farr: *Sulfaguanidine as a Prophylactic During the Acquirement of Resistance by Chickens to Cecal Coccidiosis*. *Am. J. Vet. Res.*, 4, (Jan. 1943): 50-53.]

Brucella Abortus and the Bovine Udder

The quality of the milk from *Brucella abortus* infected quarters was not significantly different from the normal product. Visible particles were not observed in the foremilk, and the pH, chloride content, leucocyte count, and saprophytic bacterial count were well within normal limits.

A careful examination of the entire parenchyma of each infected quarter failed to reveal

gross lesions. Histopathological changes were observed, however, in 17 out of 19 quarters that had harbored *Br. abortus* for periods varying from sixteen to 324 days. These consisted of an exudation of neutrophils into the alveolar lumen, associated with fatty degeneration of the alveolar epithelium with a tendency toward desquamation of epithelial cells. More commonly, however, the microscopic pathological changes were characterized by a dense accumulation of lymphocytes and plasma cells in the interalveolar tissues. Epithelioid cells and giant cells were found in some instances. In the larger inflammatory foci, proliferation of the connective tissue elements occurred. In some instances, the supramammary lymph nodes also contained histopathological changes. [A. C. Emminger and O. W. Schalm: *The Effect of Brucella Abortus on the Bovine Udder and its Secretion*. *Am. J. Vet. Res.*, 4, (Jan. 1943): 100-109.]

Inherited Bleeding Disease of Swine

During the last few years, a strain of swine owned by the Missouri Agricultural Experiment Station has been under observation because of severe bleeding tendencies. Many of the animals bleed to death from trivial wounds, or from apparently spontaneous hemorrhage. Several of the characteristics of the abnormality have been described: the disease is transmitted by both sexes as a Mendelian recessive; the blood-clotting mechanism is defective; the saline bleeding time is abnormally prolonged. The discovery of an abnormal saline bleeding time prompted the author to test the capillary resistance of the bleeder animals, for, in man, low capillary resistance and abnormal bleeding times often occur together.

Capillary resistance was determined by applying suction of varying intensity over an area of 1 cm. of skin for two minutes, in this way determining the highest negative pressure (in cm. of mercury) which would produce no petechiae.

The animals were divided into 2 groups: the bleeders, having an average saline bleeding time of more than 300 seconds, and the carriers (carrying only 1 of the 2 necessary recessive genes), having an average saline bleeding time of less than 100 seconds. The animals were

paired into 8 groups, each containing a bleeder and a carrier. The highest negative pressure that produced no petechiae in the carrier animal was determined at weekly intervals. The bleeder was then tested at the same negative pressure and the petechiae counted. The results obtained show that the bleeders consistently developed petechiae at negative pressures that did not produce petechiae in the carriers.

Elliott (*J.A.M.A.*, 110, 1938) defines capillary resistance in another way: the *lowest* negative pressure that is capable of producing 2 or more macroscopic petechiae in a skin area 1 cm. in diameter, the pressure being applied for one minute. According to this definition, the capillary resistance of the hogs ranged from 30 to 60 cm. in the carrier animals, and from 5 to 35 cm. in the bleeders.

The differences in capillary resistance which exist between the carrier and bleeder swine are as great, or even greater, than those found by Elliott to exist between normal and purpuric human beings. [*E. T. Mertz: Abnormal Capillary Resistance in Swine Suffering from an Inherited Bleeding Disease. Am. J. Physiol.*, 137, (Dec. 1942):136-139.]

Meat Inspection

This is a survey of the meat-inspection situation in Canada, where 93 packing houses operate under supervision of the Dominion meat-inspection force which includes 317 veterinary and lay inspectors who work under the direction of the Veterinary Inspector General. The inspection covers ante- and postmortem inspection of all animals slaughtered at these official abattoirs doing inter-provincial or export business. Abattoirs not having this inspection trade only within their own province. Meat stamped "Canada Approved," wherever found, is the assurance of wholesomeness, that its source was a healthy animal, and that it was prepared under modern sanitary conditions.

The details of a thorough inspection are described in respect to the detection of carcasses affected with generalized and organic diseases. One of the features is the tattooing of hogs at their source for identification, and another is the thorough washing of their carcasses under a high pressure spray; not to mention periodical cleansing and sterilizing of floors, vats, and equipment and the preservation of valuable by-products. Since hogs dress 70 per cent, cattle, 55 per cent, and lambs but 47 per cent, there is a wealth of other products besides edible meat to be utilized (hides, hair, blood, glands, hoofs, horns, tendons, sausage casings, bones, gut, *et al.*)

Condemned carcasses go denatured into oils and fertilizers after sterilization. For the year

ending March, 1942, the number of cattle carcasses condemned was 14,164. It is estimated that 55 per cent of the meat consumed in Canada is government inspected. Thus a small group renders yeoman service to that nation. [*J. D. McLellan: Meat Inspection and its Ramifications. Can. J. Comp. Med.*, 7, (March, 1943):65-71.]

Iron in Swine Breeding

Attention is again focused on the importance of iron for young pigs. The need can not be over-estimated, as maturing of hogs depends a great deal upon efficient handling of the young so as to prevent stunting and promote rapidity of growth. Iron deficiency in the early life of pigs contributes to poor nutrition and lowers resistance to the porcine infections. Encouraging breeders of swine to insure young pigs a sufficiency of iron is the duty of every veterinarian. [*Editorial: Iron Deficiency of Piglets. Can. J. Comp. Med.*, 7, (March, 1943):63.]

Sulfaguanidine in Infectious Enteritis of Swine

Sulfaguanidine was used in daily dosages from 0.07 to 0.44 Gm. per kg. body wt. (0.31 to 1.5 Gm. / 10 lb.) divided between morning and evening for the treatment of infectious enteritis in swine. In controlled experiments on 12 lots of pigs containing 2 to 14 animals each (52 treated and 31 untreated) 69 per cent of the treated animals and 16 per cent of the untreated animals recovered. A total of 133 pigs were treated under field conditions, with 92 per cent of the pigs recovering. In addition, a total of 333 swine treated under conditions of a general veterinary practice gave similar results. Preliminary toxicity trials gave no evidence of ill effects with dosages below 0.66 Gm. / kg. (3.0 Gm. / 10 lbs.). [*H. C. H. Kernkamp and M. H. Roepke: Sulfaguanidine in the Treatment of Infectious Enteritis in Swine. Am. J. Vet. Res.*, 4, (Jan. 1943): 3-14.]

Well-Placed Compliment

To the Editor:—Your last JOURNAL brought to my mind the names of two outstanding men of the veterinary profession, Doctors Michener and Salmon. It was my good fortune to be a senior student the year the National Veterinary College opened in Washington. Dr. Michener was a father to me and from him I was inspired to make a real veterinarian of myself by taking him as a model.—O. C. Bradley, Fairfield, W. Va.

BOOK NOTICES

Annual Review of Physiology

This book is the fifth volume of a series of annual reviews of physiological literature with a given group of subjects discussed in detail by chosen specialists. The panel of Volume V(1943), scheduled below, is the only review that can be undertaken here inasmuch as each of the subjects treated would require the criticism of qualified critics to be of value as such, the presumption being that the authors assigned have dug to the depths of their respective topics and that the topics themselves represent fields of physiological knowledge of contemporary interest. The scope of the book is revealed in the following schedule:

Harold F. Blum, National Cancer Institute, National Institute of Health, U.S. Public Health Service, Bethesda, Md.: *Physiological and Pathological Effects of Ultraviolet Radiation*, with 103 references.

Jack Schultz, William G. Kerckhoff Laboratories of Biology, California Institute of Technology, Pasadena, Calif.: *Physiological Aspects of Genetics*, with 177 references.

William F. Windle, Anatomical Laboratories and Institute of Neurology, Northwestern University Medical School, Chicago, Ill.: *Developmental Physiology*, with 137 references.

Franklin C. McLean, Department of Physiology, University of Chicago, Chicago, Ill.: *Physiology of Bone*, with 210 references.

E. B. Forbes and LeRoy Voris, The Institute of Animal Nutrition of the Pennsylvania State College, State College, Pa.: *Energy Metabolism*, with 72 references.

Chalmers L. Gemmill, Lieutenant Commander, M.C., U.S.N.R., School of Aviation Medicine, Naval Air Station, Pensacola, Fla.: *The Respiratory System*, with 31 references.

Ernst Fischer, Department of Physiology and Pharmacology, Medical College of Virginia, Richmond, Va.: *Muscle*, with 193 references.

R. C. Herrin, Department of Physiology, University of Wisconsin Medical School, Madison, Wis.: *The Digestive System*, with 149 references.

H. D. Bruner, Department of Physiology, University of North Carolina, Chapel Hill, N. C., and **Harrison** Department of Surgical Research, University of Pennsylvania, Philadelphia, Pa.: *Blood*, with 293 references.

Philip D. McMaster, The Rockefeller Institute of Medical Research, New York, N. Y.: *The Lymphatic System*, with 103 references.

Franklin D. Johnson and Frank L. Wilson, Department of Internal Medicine, University of Michigan, Ann Arbor, Mich.: *Heart*, with 160 references.

Birdsey Renshaw, Oberlin College, Oberlin, Ohio: *Nerve and Synaptic Transmission*, with 219 references.

Horace W. Magoun, Institute of Neurology, Northwestern University Medical School, Chicago, Ill.: *Visceral Functions of the Nervous System*, with 164 references.

L. P. Herrington and A. P. Gagge, Department of Public Health, Yale University School of Medicine, John B. Pierce Foundation, New Haven, Conn. and (Gagge), U.S. Army Air Corps, Aero-Medical Laboratory, Experimental Engineering Division, Wright Field, Dayton, Ohio: *Temperature Regulation*, with 105 references.

Jesse L. Bollman, Division of Experimental Medicine, Mayo Foundation, Rochester, Minn.: *Liver and Bile*, with 135 references.

Hallowell Davis and S. Howard Bartley, Department of Physiology, Harvard Medical School, Boston, Mass., and (Bartley) Dartmouth Eye Institute, Dartmouth College, Dartmouth, N. H.: *Sense Organs*, with 204 references.

B. A. Houssay and V. Deulopeu, Instituto de Fisiologia, Universidad de Buenos Aires, Argentina: *Metabolic Functions of the Endocrine System*, with 135 references.

John MacLeod, Department of Anatomy, Cornell University Medical School: *The Physiology of Mammalian Semen*, with 62 references.

Carroll A. Pfeiffer, Department of Anatomy, Yale University School of Medicine, New Haven, Conn.: *Endocrinology of Reproduction*, with 488 references.

N. Cameron and H. F. Harlow, Department of Psychology, University of Wisconsin, Madison, Wis.: *Physiological Psychology—The Functions. Psychoses* (Cameron) and *Physiological Correlates of Behavior* (Harlow), with 160 references.

C. I. Bliss and McKeen Cattell, Connecticut Agricultural Experiment Station, New Haven, Conn., and Cornell University Medical School (Cattell), New York, N. Y.: *Biological Assay*, with 275 references, and two tables on the response of laboratory animals to certain vitamins and hormones.

The only strictly veterinarian's work contained among the hundreds of references is that of H. S. Cameron (J.A.V.M.A. 100, (1942): 60-62) in the chapter on *Endocrinology of Reproduction*. Inasmuch as the subject of night-blindness is discussed at some length, the work of G. H. Hart on the experimental type in horses induced by vitamin A privation would have been apropos among current advances in physiopathology. [Annual Review of Physiology, Volume V, by James Murray Luck, Editor and Victor E. Hall, Associate Editor, Stanford University. Annual Reviews, Inc., Stanford University, P. O., California. 1943. Cloth. 613 pages. Price \$5.00.]

THE NEWS

AVMA

The 1943 AVMA War Conference

Hotel Jefferson — St. Louis — Aug. 25-26, 1943

The July issue of the JOURNAL will contain details of the program and other information concerning the War Conference.

Wartime Program of the Joint Committee on Foods

A meeting of the AVMA-AAHA Joint Committee on Foods was held in Chicago on May 12, 1943, to discuss the continuation of the testing work during wartime and to consider the desirability of undertaking, at the request of government agencies, additional work and responsibility with respect to pet-feeding recommendations. Members of the Committee present at the meeting were Drs. C. W. Bower, O. V. Brumley, S. W. Haigler and J. G. Hardenbergh; also M. L. Morris, executive secretary and technical consultant to the committee.

Following discontinuation of the formal seal-of-approval work for the duration, as announced in the April JOURNAL (pp. 317-318), many expressions of opinion have been received from both inside and outside the veterinary profession to the effect that the testing and research activities of the Committee should, if at all possible, be continued in some form. The provision of adequate nutrition for pet animals and zoölogical collections under the food rationing restrictions designed to conserve human foods is admittedly a problem of increasing magnitude.

After careful deliberation of all factors involved, it was decided to continue the testing, on a modified basis, of prepared dog foods for those companies who are desirous of having their products subjected to supervision. The seal of approval will not be granted but the use of a statement will be permitted on the labels of the pet foods which are submitted for

test and are found acceptable from a nutritional standpoint.

COÖPERATION WITH FEDERAL AGENCIES

In recent weeks, representatives of the Joint Committee and of the coöperating associations have been called upon by agencies within the federal Food Administration for suggestions and advice regarding the feeding of carnivorous pets. The Government has given careful consideration to the problem in view of its humanitarian aspects, the importance of dogs and cats in rodent control as a conservation measure for human foods, and the evident desire of many people to maintain their pets for morale and guardian purposes.

As a result, the Joint Committee authorized coöperation with authorities in the Food Administration who have requested that the facilities of the Committee be made available in an unofficial advisory capacity with respect to information and recommendations on the wartime feeding of dogs and other carnivorous pets. The guiding principle of all this work will be to maintain, as well as possible, the nutritional well-being of these animals by utilizing available ingredients not suitable or needed for human food or for feeds for food-producing animals.

AVMA to Occupy New Quarters at Same Address About June 1

To meet the expanding needs of the Association's work and to provide much-needed library and storage space, the offices of the Association will be moved into larger quarters on the same floor now occupied in the Fairbanks-Morse Building on or shortly after June 1, 1943. The

address will remain the same: 600 So. Michigan Ave., Chicago.

The Board of Governors has authorized the execution of a new lease for a period of three years. The present offices, known as suite 801, have been occupied since Sept. 1, 1940; the new quarters, known as suite 810-814, will provide somewhat larger office space, a good-sized library and conference room, and a storage room which has not been previously available in the building.

"The latch-string is always out" at AVMA headquarters for members and friends of the Association; members especially are invited and urged to visit their Association offices whenever they are in Chicago.

Can You Help Locate These Lost Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be greatly appreciated.

Adams, James L., Rt. No. 2 Box 160, Greeley, Colo.

Cox, M. T., 650 Irapelo Rd., Waltham, Mass.

Crow, Louis C., c/o Gen. Del., Ada, Okla.

Dayman, G. L., 1015 N. Olive, Burbank, Calif.

Fluhart, D. M., Co. B—30 M.T.B., 1st Platoon, Camp Grant, Ill.

Friedburg, Klaus M., c/o Gordon Animal Hosp., 8210 S. Ashland Ave., Chicago, Ill.

Holtzman, Jacob, Station Hosp., Army Air Base, Fort Douglas, Utah.

Hupp, Lynn D., 1339 E. Armour, Kansas City, Mo.

Ingram, H. E., c/o Swift & Co., 2300 S. Lamar, Dallas, Texas.

Irvin, Hugh, 430 W. Cambridge Ave., College Park, Ga.

Lovvorn, R. D., 910 N. McLean St., Memphis, Tenn.

McGill, Dana T., Mt. Sterling, Ill.

McGinnis, Velmer W., Ft. Benning, Ga.

Martin, Jerry T., Quitman, Texas.

Mathis, Rudy C., State Veterinarian, Atlanta, Ga.

Melman, Harold, 4843 Reistertown Rd., Baltimore, Md.

Moon, E. E., Hqs. U. S. Army, Recruit Station, Ft. Crook, Neb.

Newhart, Charles C., Warren Hotel, Garden City, Kansas.

Robertson, D. S., Fort Sam Houston, Texas.

Schmille, H. F., Westboro, Mo.

Shay, H. Robert, Gen. Del., El Dorado, Ark.

Siver, Dougal, 429 Wrightwood Ave., Apt. 1-N, Chicago, Ill.

Smith, Chas. L., Rt. No. 1, Harveyville, Kansas.

Smith, Lawrence G., Gen. Del., Waynesville, N. Car.

Tedder, P. W., Edenton, N. Car.

Vance, Arthur, Vernal, Utah.

Vogel, W. M., 457 Sandhurst Drive, Dayton, Ohio.

Williams, G. A., 1374 Sunset Blvd., Los Angeles, Calif.

Woodruff, Raymond A., 61 Pleasant St., Norwich, N. Y.

What the Newspapers Say

(Excerpts from Educational Publicity Material issued by the AVMA Public Relations Department.)

Newaygo (Mich.) Republican

(Apr. 8, 1943)

Two steps by which farmers this spring can achieve greatest results in increasing pork production for the nation's war needs, were outlined here recently in a report issued by the Committee on Swine Diseases of the American Veterinary Medical Association.

• • •

Waverly (Tenn.) Democrat

(Apr. 1, 1943)

Every pig, calf, cow and chicken is a "soldier" this year—Every farmer is a "captain" of these farm troops in the 1943 battle to produce food for the war effort.

This is the keynote of a challenge to farmers issued in a drive to reduce livestock disease losses by the American Veterinary Medical Association. . .

• • •

Fresno (Calif.) Bee

(Apr. 25, 1943)

Of all the problems that hob up to bother the dairy farmer, milk fever has been one of the most common and most difficult to cope with. . .

The American Veterinary Medical Association reports a treatment for milk fever. . .

• • •

Jefferson City (Mo.) Farm News

(Apr. 7, 1943)

Slaughter and disease are decimating European herds and flocks, reports the Chicago Daily Drivers' Journal. Dr. O. V. Brumley of the American Veterinary Medical Association estimates that Europe's horse, cattle, swine, and sheep populations have already declined by more than 35 million head. . .

Other Newspaper Comment

Bryan (Tex.) Eagle

(Apr. 13, 1943)

The Board of Directors of the Brazos County (Texas) Tuberculosis Association met last night. . .

Dr. Jessie Whitacre . . . stated that the medical societies and tuberculosis associations of

Minnesota had followed the plan of the U. S. Bureau of Animal Industry and the American Veterinary Medical Association in issuing certificates of credits to counties having certain freedom from tuberculosis among human beings as has been practiced with reference to cattle. . .

Mrs. Wimberley [president] appointed an educational committee . . . instructed them to proceed with plans of testing every person in Brazos county . . . [and] to appeal to the State Medical Association, the Texas Tuberculosis Association, the State Board of Health and the Governor to establish a standard of credit for counties showing a certain freedom from tuberculosis among human beings in Texas.

• • •

Covington (Ky.) Enquirer

(Apr. 3, 1943)

L. K. Bear, animal husbandry specialist for the Ohio State University Agricultural Extension Service, and Dave Bailey, Warren County Agricultural Agent, will discuss care of sheep and lambs for rural listeners on WLW's "Everybody's Farm Hour" today, 12:30 a. m. The second half of the program features a new series entitled "Keep 'Em Healthy."

The Veterinary Association of Ohio, Kentucky, and Indiana sends as the first speaker Dr. A. G. Madden of Madeira, Ohio, to discuss ways and means to cut down livestock diseases and parasites as a vital help to wartime food production.

Newspaper Headlines

More Pork Through Disease Control.—*Clarks (Neb.) Enterprise*.

Rabies and Live Stock.—*People's Column in Bristol (Tenn.) Herald-Courier*.

U. S. Helping Britain Fight Cattle Disease.—*Richmond (Tex.) Coaster*.

Pig, Calf and Chick Must Count This Year.—*Dyersburg (Tenn.) Gazette*.

Best Care Needed to Produce Meats.—*Columbia (Tenn.) Herald*.

Lack of Calcium Blamed for Milk Fever in Cows.—*Fresno (Cal.) Bee*.

Control of Stock Diseases Advised.—*Waverly (Tenn.) Democrat*.

Europe's Herds Suffer, Slaughter and Disease Take Heavy Toll.—*Jefferson City (Mo.) Farm News*.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

AKIN, H. S.

Rt. 2—Box 367-A, Hanford, Calif.

D.V.S., Colorado State College, 1910.

Vouchers: A. C. Rosenberger and E. R. Braun.

BURCH, GEORGE R.

1911 Elizabeth, Wichita Falls, Texas.

D.V.M., Texas A. & M. College, 1938.

Vouchers: W. C. Dye and Dan Roberts.

CROW, WILFRED M.

APD No. 937, c/o P.M., Seattle, Wash.

D.V.M., Washington State College, 1938.

Vouchers: O. H. Muth and J. G. Hardenbergh.

DENNY, WILLIAM A.

Co. B—26 M.T.B. T-224, Camp Grant, Ill.

B.V.Sc., Ontario Veterinary College, 1942.

Vouchers: A. G. Misener and J. G. Hardenbergh.

FRANK, GEORGE A.

5468 Enright Ave., St. Louis, Mo.

V.M.D., University of Pennsylvania, 1918.

Vouchers: J. P. Torrey and S. W. Haigler.

GROSS, CLIFFORD L.

422 S. Main St., Bel Air, Md.

D.V.M., Alabama Polytechnic Institute, 1941.

Vouchers: R. F. Jackson and Mark Welsh.

HULBUSH, WILLIAM R.

Station Hosp., Santa Ana Army Air Base, Santa Ana, Calif.

D.V.M., Washington State College, 1938.

Vouchers: J. A. Fitch and N. M. Neate.

KNAPSTEIN, T. L.

Greenville, Wis.

D.V.M., Chicago Veterinary College, 1916.

Vouchers: W. Wisnicky and J. S. Healy.

SCHMELZER, NORBERT

4907 Maryland Ave., St. Louis, Mo.

D.M.V., Institute Superior of Veterinary Medicine, Pisa, Italy, 1933.

Vouchers: S. W. Haigler and J. G. Hardenbergh.

STEWART, L. C.

5600 State St., E. St. Louis, Ill.

D.V.M., Kansas City Veterinary College, 1918.

Vouchers: S. W. Haigler and J. P. Torrey.

VISGER, EDMUND E.

Okemos, Mich.

D.V.M., Michigan State College, 1937.

Vouchers: F. W. Chamberlaine and C. F. Clark.

WHITNEY, C. T.

73 Pine St., Burlington, Vt.

D.V.M., Cornell University, 1938.

Vouchers: L. A. Evans and G. N. Welch.

Second Listing

Barton, Robert A., 1001 Kenmore Ave., Fredericksburg, Va.
 Braunworth, Elmer H., Chaska, Minn.
 Colgate, R. F., 17 Rectory Rd., Weston, Ont., Can.
 DeVolt, H. M., 5009 Hollywood Rd., Berwyn, Md.
 Havel, Dr. S. N., 301 S. 4th St., Denver, Pa.
 Johnston, James M., 450 E. Holly Ave., Pitman, N. J.
 Miller, M. W., 2204 San Jacinto St., Houston, Texas.
 Parker, C. M., Box 741, Warrenton, Va.
 Segal, Lawrence, 210½ Abbott Rd., Apt. 32, East Lansing, Mich.

1943 Graduate Applicants**First Listing**

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Iowa State College

KITCHELL, RALPH L., D.V.M.,
 Dept. of Bact., Kansas State College,
 Manhattan, Kansas.
 Vouchers: H. L. Foust and I. A. Merchant.
 NORDEN, CARL J., JR., D.V.M.
 3449 E. Pershing Rd., Lincoln, Neb.
 Vouchers: H. D. Bergman and Chas. Murray.

University of Pennsylvania

THOMPSON, WM. BURKE, V.M.D.
 439 45th St., Brooklyn, N. Y.
 Vouchers: W. L. Mackey, Jr. and M. A. Emerson.

Texas A. & M. College

MATHENEY, ROBERT G., D.V.M.
 Box 95, Corozal, C. Z.
 Vouchers: B. N. Winchester and R. P. Juni.

Second Listing**Iowa State College**

Anderson, G. Orville, D.V.M., Swea City, Iowa.
 Banks, Robert C., D.V.M., Tipton, Iowa.
 Becker, Leo F., D.V.M., 401 S. Clark, Maquoketa, Iowa.
 Brager, R. C., D.V.M., Clear Lake, Iowa.
 Brown, Russell W., D.V.M., Gran Apts., Storm Lake, Iowa.
 Calhoun, William H., D.V.M., Huxley, Iowa.
 Dykstra, C. F., D.V.M., George, Iowa.
 Fisher, Lester, D.V.M., 2880 Archer Ave., Chicago, Ill.

Fistler, Ray P., D.V.M., Freeport, Ill.
 Flickinger, Milton, D.V.M., R.F.D. No. 1, Aurora, Iowa.
 Gray, D. H., D.V.M., Schaller, Iowa.
 Griffiths, Henry J., D.V.M., 9 Elmwood Apts., South St., Halifax, Nova Scotia, Can.
 Haight, P. M., D.V.M., 118 Denver St., Sterling, Colo.
 Hylton, Jack Warren, D.V.M., 404 W 69th St., Los Angeles, Calif.
 Irvine, Robert D., D.V.M., 127 Campus Ave., Ames, Iowa.
 Karper, Melvin W., D.V.M., Slater, Iowa.
 Klett, Wilbert M., D.V.M., Milford, Iowa.
 Lofton, Robert Douglas, D.V.M., Lakota, N. D.
 Loucks, Joseph L., D.V.M., c/o Dr. C. L. Wilhite, Manning, Iowa.
 McIntire, J. C., D.V.M., 606 Franklin St., Pella, Iowa.
 Mackereth, Robert D., D.V.M., Annandale, Minn.
 Mannasmith, Clarence H., D.V.M., Clarinda, Iowa.
 Marsh, Herbert L., D.V.M., Woodstock, Ill.
 Melles, Leonard H., D.V.M., Paullina, Iowa.
 Morgan, Richard, D.V.M., 818 Eighth St., Ames, Iowa.
 Nelson, Albin J., D.V.M., Gravity, Iowa.
 O'Harra, John L., D.V.M., Merced Vet. Hosp., Merced, Calif.
 Penkert, R. A., D.V.M., Reedsburg, Wis.
 Pennings, A. W., D.V.M., Alton, Iowa.
 Rawson, D. Wayne, D.V.M., Elburn, Ill.
 Reppert, R. F., D.V.M., Pender, Neb.
 Reppert, R. E., D.V.M., 108 E. Division, Ke-wanee, Ill.
 Rhodes, James D., D.V.M., 1404 Park Ave., Fort Dodge, Iowa.
 Rossing, Tedmar D., D.V.M., Bode, Iowa.
 Savage, Robert E., D.V.M., 701 E. Park Ave., Spencer, Iowa.
 Schweim, Erich A., D.V.M., Springfield, Minn.
 Skamser, Leonard M., D.V.M., Litchfield, Minn.
 Smith, Philip E., D.V.M., Clarion, Iowa.
 Spaulding, Donald L., D.V.M., 3304 Maple St., Omaha, Neb.
 Stepp, F. A., D.V.M., 400 W. Main, Union City, Tenn.
 Swain, Lyle W., D.V.M., Osceola, Iowa.
 Thompson, Floyd W., D.V.M., 912 23rd St., Sioux City, Iowa.
 Vande Garde, Gerald C., D.V.M., Brooklyn, Iowa.
 Wahl, Robert Charles, D.V.M., Gladbrook, Iowa.
 Winslade, Jack Lamar, D.V.M., Shipman, Ill.

Michigan State College

Appelhof, William K., D.V.M., Rt. No. 2, Grand Blanc, Mich.
 Auker, Joe A., D.V.M., R.R. No. 2, South Whitley, Ind.
 Beebe, Gerald J., D.V.M., 403½ S. Main, Royal Oak, Mich.
 Beebe, Raymond, D.V.M., 518 N. Stewart, Fremont, Mich.

- Benson, Herbert Jay, D.V.M., 237½ Valley Ct., East Lansing, Mich.
- Besancon, Frederick W., D.V.M., 15006 Biltmore Ave., Detroit, Mich.
- Blume, Ervin Virgil, D.V.M., R.R. No. 9, Fort Wayne, Ind.
- Carlson, Paul A., D.V.M., 2329 Edwards St., Berkeley, Calif.
- Chapel, Donald Floyde, D.V.M., 903 Lansing Ave., Jackson, Mich.
- Connaughton, Harold, D.V.M., Lawrance, Mich.
- Corrie, Garth, D.V.M., R.F.D. No. 2, Lake, Mich.
- Creswell, Richard A., D.V.M., 213 Prospect, St. Louis, Mich.
- Culham, Merrill Eugene, D.V.M., 219 N. Page St., Stoughton, Wis.
- Decker, Norman K., D.V.M., Colon, Mich.
- Doll, Elvis R., D.V.M., Dept. of Ani. Path., University of Kentucky, Lexington, Ky.
- Ellis, David J., D.V.M., R.F.D. No. 2, Corunna, Mich.
- Feldman, Henry Fred, Jr., D.V.M., Deerfield, Mich.
- Ferguson, Frederick, D.V.M., 2020 Madison Ave., Grand Rapids, Mich.
- Foster, Howard K., D.V.M., 170 N. 2nd West St., Cedar City, Utah.
- Holtz, Fred, D.V.M., Rochester, Mich.
- Hornbacker, Vern G., D.V.M., Sebewaing, Mich.
- Jeffery, George, D.V.M., Sherwood, Mich.
- Kaser, Clarence LeMoyné, D.V.M., Rt. No. 6, St. Johns, Mich.
- King, Harold C., D.V.M., 205 Moores River Dr., Lansing, Mich.
- Kinne, Harry W., D.V.M., 337 Post Office Bldg., Bismarck, N. Dak.
- Kosht, Duane, L., D.V.M., 910 Seward, Detroit, Mich.
- Luoto, Lauri, D.V.M., 7 Coleman St., Gardner, Mass.
- McAfee, John, D.V.M., R.R. No. 1, Applegate, Mich.
- McLeod, Kenneth Leroy, D.V.M., 403 Oxford Rd., East Lansing, Mich.
- Moore, Donald L., D.V.M., Athens, Mich.
- Morris, John H., II, D.V.M., 935 E. Grand River, East Lansing, Mich.
- Morse, Wendell C., D.V.M., 710 Shepard St., Lansing, Mich.
- Munro, Harry R., D.V.M., 516 E. Lincoln Ave., Zeeland, Mich.
- Myhers, Palmer S., D.V.M., Eleva, Wis.
- Neuhauser, Maurice D., D.V.M., c/o W. G. Theobald, Archbold, Ohio.
- Osborn, Lee H., D.V.M., 1002 W. Main St., Danville, Ind.
- Quinn, John F., D.V.M., Elkton, Mich.
- Ritchie, James R., D.V.M., R.F.D., No. 1, Plymouth, Mich.
- Segal, Dorothy, D.V.M., 210½ Abbott Rd., Apt. 32, East Lansing, Mich.
- Sheets, Waynard, R., D.V.M., 1461 E. Ohio St., Frankfort, Ind.
- Shillinger, Robert B., D.V.M., Easton, Talbot County, Md.
- Stoe, Lysle Arnold, D.V.M., Church's Ferry, N. Dak.
- Ten Broeck, Charles Walter, D.V.M., 22739 Grove Ave., East Detroit, Mich.
- Vander Wall, Edwin R., D.V.M., New Era, Mich.
- Wheeler, James E., D.V.M., 72 East State St., Montpelier, Vt.
- Wilson, J. A., D.V.M., 586 Dyer St., Burlington, Wis.
- Wood, Ivan H., D.V.M., 423 Charles, East Lansing, Mich.
- Woodward, John B., D.V.M., 1718 Yohara Pl., Madison, Wis.
- Wright, Betty, D.V.M., Fowlerville, Mich.

Ohio State University

- Abbott, William L., D.V.M., Rt. No. 1, Broadlawn Farm, Downers Grove, Ill.
- Bailey, Robert M., D.V.M., 518 13th St., Bowling Green, Ky.
- Blair, Albert R., D.V.M., 2000 Tate Ave., Cleveland, Ohio.
- Bremer, Louis H., D.V.M., Wilmington, Ohio.
- Burton, Arthur A., D.V.M., Westerville, Ohio.
- Chehayle, Clarence, D.V.M., 3424 W. 90th St., Cleveland, Ohio.
- Clark, Robert P., D.V.M., Rt. No. 2, Bellefontaine, Ohio.
- Claugus, Frederick, D.V.M., Woodsfield, Ohio.
- Cole, Clarence R., D.V.M., Ohio State University, Veterinary Clinic, Columbus, Ohio.
- Duber, Anthony G., D.V.M., 215 E. Williams St., Delaware, Ohio.
- Faulkner, Harold W., D.V.M., Rt. No. 1, Carthage, Ill.
- Graham, Laverne P., D.V.M., 1609 Hunter Ave., Columbus, Ohio.
- Grundish, Roger W., D.V.M., 1978½ Summit St., Columbus, Ohio.
- Hall, Howard H., D.V.M., 2207 N. 4th St., Columbus, Ohio.
- Hawley, Dan, D.V.M., 510 N. Broadway, Greenville, Ohio.
- Hejnsen, Paul B., D.V.M., 1000 S. Main St., Piqua, Ohio.
- Hodesson, Samuel, D.V.M., 344 Willis Ave., Youngstown, Ohio.
- Junk, Dick R., D.V.M., Rt. No. 6, Washington C. H., Ohio.
- Krantz, Elden, D.V.M., Rt. No. 3, Dover, Ohio.
- Lamb, Hugh, D.V.M., Rt. No. 2, Ashville, Ohio.
- McClarren, R. M., D.V.M., 1456 Loretta Ave., Columbus, Ohio.
- McQuown, Paul F., D.V.M., 724 N. Campbell, Tucson, Ariz.
- Mainwaring, Glyn, D.V.M., 1864 E. 97th St., Cleveland, Ohio.
- Meisinger, Fred H., D.V.M., Rt. No. 4, Box No. 3, Naperville, Ill.
- Miller, Robert R., D.V.M., 11 Hamilton Ave., Wheeling, W. Va.

Milton, Charles S., D.V.M., Charles Town, W. Va.
 Montgomery, Charles W., D.V.M., 622 N. Gallo-
 way St., Xenia, Ohio.
 Newton, William H., D.V.M., Ashville, Ohio.
 Nickerson, John H., D.V.M., Orwell, Vt.
 Oldham, William R., D.V.M., Rt. No. 2, Carth-
 age, Ind.
 Patton, Clyde A., D.V.M., 303 E. Cecil St.,
 Springfield, Ohio.
 Peck, Edsell C., D.V.M., Rt. No. 1, West Middle-
 town, Ohio.
 Priestley, Archie C., D.V.M., Gallipolis, Ohio.
 Ripley, Richard A., D.V.M., Rt. No. 2, Kent,
 Ohio.
 Ross, Walter E., D.V.M., 471 Stowe Ave., Cuya-
 hoga Falls, Ohio.
 Rumlper, Ward V., D.V.M., Rt. No. 1, Grafton,
 Ohio.
 Schoonover, Hobart D., D.V.M., 214 E. Sandusky
 St., Findley, Ohio.
 Southard, Francis I., D.V.M., 105 Don Allen Rd.,
 St. Mathews, Ky.
 Spanabel, John J., D.V.M., 87 Vine St., East
 Palestine, Ohio.
 Sprowl, R. W., D.V.M., 2243 Neil Ave., Colum-
 bus, Ohio.
 Stout, Robert W., D.V.M., Rt. No. 1, Vevay, Ind.
 Tossey, Carrol, D.V.M., 1466 Michigan Ave.,
 Columbus, Ohio.
 Traphagen, Douglas, D.V.M., 290 E. Lane Ave.,
 Columbus, Ohio.
 Vollmer, John H., D.V.M., 2615 Maplewood Ave.,
 Toledo, Ohio.
 Voss, Robert F., D.V.M., St. Johns, Ohio.
 Walters, Ralph D., D.V.M., 91 W. 10th Ave., Co-
 lumbus, Ohio.
 Weight, Thomas H., D.V.M., 445 Mt. Vernon Rd.,
 Newark, Ohio.
 Welbourn, Russell W., D.V.M., Union City, Ind.
 Winkler, J. E., D.V.M., 240 Rosemont Ave., Fort
 Thomas, Ky.
 Wynkoop, Judson R., D.V.M., 1495 Pennsylvania
 Ave., Columbus, Ohio.

Ontario Veterinary College

Zlotnick, Leon, B.V.Sc., 322 Church Ave., Win-
 nipeg, Man., Can.

University of Pennsylvania

Abrahamson, Joseph, V.M.D., 2028 Chestnut St.,
 Philadelphia, Pa.
 Berkelhammer, Albert M., V.M.D., 211 N. 34th
 St., Philadelphia, Pa.
 Brown, Joseph F., V.M.D., P. O. Box 465, Duns-
 muir, Calif.
 Collins, Daniel J., V.M.D., 1000 South St., Pitts-
 field, Mass.
 DeMott, Thomas, V.M.D., Millington, N. J.
 Detweiler, J. Warren, V.M.D., Telford, Pa.
 Doolittle, Herbert S., Jr., V.M.D., Litchfield
 Turnpike, c/o Westville P. O., New Haven,
 Conn.
 Downhill, Wallace J., V.M.D., 65 Eddy St.,
 Springfield, Mass.

Elting, Stewart E., V.M.D., P. O. Box 173, Wood-
 bury, Conn.
 Fridirici, Ira M., V.M.D., Orwigsburg, Pa.
 Gartner, Harold H., V.M.D., 746 Main St., Peck-
 ville, Pa.
 Good, Archie L., V.M.D., 223 N. George St.,
 Millersville, Pa.
 Groveman, Joseph H., V.M.D., 210 Farnsworth
 Ave., Bordentown, N. J.
 Guss, Samuel B., V.M.D., 931 Oley St., Reading,
 Pa.
 Hall, Jonathan P., V.M.D., 54 Seventh St.,
 Lowell, Mass.
 Hickman, George R., Jr., V.M.D., 46 Chiswick
 Rd., Brighton, Mass.
 High, William P., V.M.D., 105 Pine St., Middle-
 town, Pa.
 Hitchner, S. B., V.M.D., Daretown, N. J.
 Iobst, F. Murray, V.M.D., 120 Macungie Ave.,
 Emmaus, Pa.
 Keeler, John R., V.M.D., 3804 Albermarle St.,
 N. W., Washington, D. C.
 Kutish, Edward, V.M.D., 54 Mack St., Plains, Pa.
 Larson, Howard, S., V.M.D., 55 Elm St., Deep
 River, Conn.
 Lippincott, John E., V.M.D., 22 Euclid Ave.,
 Haddonfield, N. J.
 Liscomb, John, V.M.D., Hulls Cove, Maine.
 Mattern, George Wilson, V.M.D., 709 N. Duke
 St., Lancaster, Pa.
 Norris, H. Ward, V.M.D., New Milford, Pa.
 O'Keefe, Francis A., V.M.D., Pine Brook Farm,
 Box 398, Warrenton, Va.
 Osen, Edwin J., V.M.D., Anita, Iowa.
 Power, Francis E., V.M.D., Birdsboro, Pa.
 Ross, Morris H., V.M.D., 4240 Viola St., Phila-
 delphia, Pa.
 Ryan, Edward T., Jr., V.M.D., 143 Winchester
 St., Brookline, Mass.
 Shellenberger, James M., V.M.D., Tannersville,
 Pa.
 Simington, Joseph O., V.M.D., R. D. No. 1, Dan-
 ville, Pa.
 Slider, Howard B., Jr., V.M.D., 339 Gates St.,
 Roxobrough, Philadelphia, Pa.
 Sperling, F. George, V.M.D., Anthony and New
 Ardmore Aves., Brookthorp Hills, Newton
 Square, Pa.
 Stefanick, Jack E., V.M.D., R.F.D. No. 2, Sharps-
 ville, Pa.
 Strittmatter, Thos. P., Jr., V.M.D., R.D. No. 5,
 West Chester, Pa.
 Swartz, Abraham L., V.M.D., 901 Mifflin St.,
 Huntingdon, Pa.
 Swope, Robert E., V.M.D., 701 Lees Ave., Col-
 lingswood, N. J.
 Waple, M. J., Jr., V.M.D., Rt. No. 3, Box 59,
 Alexandria, Va.
 Weber, Robert B., V.M.D., R.D. No. 2, Mechanics-
 burg, Pa.
 Whitlock, James A., V.M.D., 3812 Locust St.,
 Philadelphia, Pa.

COMMENCEMENTS

Ontario Veterinary College

The following candidates received the degree of Bachelor of Veterinary Science (B.V.Sc.) at the convocation of the University of Toronto, May 14, 1943:

Ballantyne, E. E.	McCormick, G. E.
Carter, G. R.	Nagge, W. T.
Christie, D. C.	Newby, W. C.
Comfort, C. F.	Nundal, E. L.
Corrigan, L. W.	Schuett, L. R. J.
Damude, D. F.	Selke, J. C.
Earl, E. R. C.	Sheppard, J. T. B.
Hanna, A. A.	Shipsides, S. H.
Hanna, G. E.	Smith, D. L. T.
Henderson, G. W.	Soltys, A.
Kenney, R. H.	South, P. J.
Knox, M. H.	Sparling, I. R.
Lawrence, R. E.	Steep, W. A.
LeClaire, H. A. R.	Steeves, D. M.
Levie, L. G.	Stirk, G. D.
Lomas, J. C.	Talbot, G. P.
Loos, P. W. J.	Taylor, I. W.
MacKinnon, A. J.	Walker, M. L.
Magwood, S. E.	Waller, C. L.
Martin, W. P.	Zlotnick, L.
McCallum, Rex	

The prize awards for honor standing were: the Gold Medal, awarded by the College for highest aggregate standing, to E. L. Nundal; second prize to E. E. Ballantyne, and third prize to D. L. T. Smith. The Andrew Smith Memorial Medal was awarded to E. E. Ballantyne; the Helen Duncan McGilvray Prize to D. L. T. Smith; the Bacteriology Prize to R. E. Lawrence, and the Canadian Army Veterinary Corps Prize to G. P. Talbot.

U. S. GOVERNMENT

The Supply Status of Medical Equipment and Drugs

The War Production Board, through its priority controls, maintains supervision over essential materials in practically every field of industry and science. The following information is based on a round-up of data pertaining to medical and surgical supplies recently released through the OWI.

Hospital Ware (Basins, Trays, etc.)—has gone back to enamel from stainless steel. The 50-odd styles and sizes have been reduced to 11.

Surgical Instruments—adequate supply.

Anesthetics—Sufficient supply if not wasted.

Surgical Sutures.—In order to maintain needed production, WPB is requiring all packing-

houses which slaughtered more than 1,000 sheep in 1942 to fill purchase orders for sheep intestines for sutures before delivering any for other purposes.

Surgical Bandages, Adhesive Tape, Etc.—Supplies sufficient and high production being continued.

Hypodermic Needles and Syringes—are being made of same materials as before the war and in sufficient numbers to meet real needs. However, to conserve supplies and critical metals, they may no longer be packed with single doses of serums, vaccines and antitoxins. Standardization and simplification of hypodermic equipment is being worked out.

Sulfa Drugs—available.

Quinine.—This and related drugs may be used only for antimalarial preparations, except for quinidine which may be used for cardiac disorders. Large amounts of quinine is needed to combat malaria among American armed forces in the tropics.

Such drugs as boric acid, borax, sulfur compounds, epsom salts, camphor, mineral and petroleum jelly can be adequately supplied.

Rubber is being conserved but needed supplies of surgical gloves and tubing are available.

Office of Community War Services Replaces Office of Defense Health and Welfare Services

On April 29, President Roosevelt signed an executive order abolishing the Office of Defense Health and Welfare Services and transferring its functions to the Federal Security Agency. The office was established in September, 1941. The order also authorized a new set-up to be known as the Office of Community War Services.

According to the official agency order issued by Federal Security Administrator Paul V. McNutt on April 29, the Office of Community War Service shall:

a) Serve as the center for the coordination of health and welfare services made available by the departments and agencies of the federal Government, and other agencies, public and private, to meet the needs of state and local communities arising from the war program; and take necessary steps to secure the cooperation of the appropriate federal departments and agencies relative thereto.

b) Make available to states and localities, upon request, the services of specialists in health and welfare activities to assist in the planning and execution of such local and state programs.

c) Study, plan, and encourage measures designed to assure the provision of adequate war health and welfare services to the citizens of the Nation during the period of the emergency, and coordinate studies and surveys made by federal departments and agencies with respect to these fields.

AMONG THE STATES

California

A regular meeting of the Southern California Small Animal Hospital Association was held at Eleda Cafe, Los Angeles, the evening of April 21, 1943. The officers in charge were N. L. McBride, Pasadena, *president* and Eugene C. Jones, Los Angeles, *secretary*. The advisability of the state association holding a meeting in June was discussed at length. Owing to the restrictions on travel (auto, bus, railway), opinions differed as to the advisability of postponing the summer meeting. The vote taken favored the holding of the usual meeting.

A member exhibited the motion picture film of A. C. Merrick, Brookfield, Ill., on "Skin Diseases of Dogs, Their Cause and Treatment," which introduces a grass fungus as a common cause of eczematous flare-ups. E. L. Vail, United States Wildlife Service, spoke on the subject of freezing condemned livers of meat animals for the feeding of fur-bearing animals and dogs as a means of conserving meat products. L. A. Merillat, editor of the *Journal of the American Veterinary Association* spoke briefly on the advantage of organized veterinary medicine. The meeting closed with an after-midnight lunch. The veterinary situation of southern California is told in four words: business good, help scarce.

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They Are Just Making Us Apologize.—George Winfield Scott, former professor of international law and diplomacy at Columbia University told the Lawyers' Club of Los Angeles* that the cause of the war with Japan is the discourtesy of the United States when, in 1924, it restricted Japanese immigration. Quoting: "If we had been more polite and courteous, there would never have been a war with Japan." The former professor added that he hoped his remarks would not be misconstrued, but he failed to explain just how polite a country must be in restricting alien colonization.—*L.A.M.*

**Los Angeles Times*, May 6, 1943.

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Rabbits.—The meat shortage is partly met in this state by its 10,000 rabbit breeders. The Rabbit Experiment Station at Fontana announces that 7 million pounds of rabbit meat was consumed in Los Angeles alone in 1942. Although once exported to eastern markets, rabbit meat mostly is consumed locally. White rabbits are preferred for breeding because the fur, which is a by-product of the industry, can be dyed any color, thereby adding to the price

paid for the carcass. The government urges that rabbit breeding for 1943 be increased 25 per cent over 1942.

Most of the rabbit fur used by the American garment industry has been imported from Australia where wild rabbits are numerous. The backyard breeding of rabbits for the household is encouraged as is also the breeding of Angoras which command up to \$7.00 a pound for their wool. Meat rabbits bring around 18 cents a pound and two does and a buck will produce almost all of the meat a family needs.

Canada

The armed forces and civilian population require 125 million pounds of lamb and mutton annually. In 1942, sheep furnished 13 million pounds of shorn wool and 5 million pounds of pulled wool, or but 14 per cent of the total requirement. Breeding ewes and ewe lambs are being added to the flocks in the anticipation of increasing sheep production 30 per cent. In sheep raising labor is not a serious problem, shelter is cheap and marginal land can be used for pasture. Aside from shearing, sheep can be handled by the children, the women and the old men. Careful management is, however, essential. Unhealthy sheep can not produce maximum returns, either in lambs or wool. Nutrition is important (good pasture, legume roughage, oats, wheat, bran, minerals).—*From an editorial in Can. J. Comp. Med. and Vet. Sci.*

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Personal.—Dr. Chas. A. Mitchell has been appointed Chief of the Division of Animal Pathology, Dominion Department of Agriculture, Canada, to succeed Dr. E. A. Watson, who recently retired.

Colorado

Dean Newsom Awarded Honor Plaque.—At the Colorado State College commencement exercises on April 23, 1943, Dr. I. E. Newsom, dean of the Division of Veterinary Medicine, received the honor alumnus plaque in recognition of his outstanding scholastic attainments and professional achievements. The award was presented by Harold E. Hogsett of Greeley, Colo., vice-president of the college alumni association.

Dr. Newsom, who was a member of the AVMA Executive Board from 1936-1941 (chairman in 1940 and 1941), was born in Colorado City, Texas, April 13, 1883. He received his B.S. degree from Colorado State College in 1904, a D.V.S. degree from San Francisco Veterinary College in 1906, and a similar degree

from Kansas City Veterinary College in 1909. Later he did graduate work at the University of Chicago and at the medical school of Colorado University.

Dr. Newsom first became associated with the veterinary faculty at Colorado State College in 1907, when the three-year course leading to a degree was established at that institution. He taught veterinary anatomy from 1908 to 1912, was associate professor (1912-18), and later professor of veterinary pathology (1918-1934). In 1934, Dr. Newsom was appointed dean of the veterinary division and in



I. E. Newsom

1939 was named vice-president of the college. Two years ago, when the graduate school was organized, he was also chosen dean of that division.

Dean Newsom has received recognition for outstanding work in sheep diseases, bovine brucellosis and brisket disease in cattle. He acted as director of the Colorado Experiment Station from September, 1939 until July, 1941. In the latter year, he received the honorary degree of Doctor of Science from Colorado University.

Illinois

Community Sales Barns Regulation.—New sanitary standards on the regulation of sales barns have been established by the Department of Agriculture. The regulation provides for a veterinary inspector at community sales charged with the inspection of all livestock offered for sale. No animal shall be sold until approved by the veterinary inspector and he shall remain at the sale barn until all animals are sold and all requirements for their removal have been fulfilled. The sanitary standards required are described in respect to light, ventilation, flooring, cleanliness, drainage, and equipment needed to maintain the standards laid down. Definite rules are made for the vaccination and tagging of hogs. Newly vaccinated hogs are quarantined to the purchaser for 21 days or until released by the Department. Hogs sold for immediate slaughter are exempt, provided they are so disposed of within ten days. Each hog sold must be identified as to consignor and purchaser on the sale barn records. The regulations went into effect April 1, 1943.

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Brucellosis Vaccination.—A revised regulation effective May 1, 1943, prohibits the use of live culture abortion vaccine except by licensed veterinarians who are issued a permit by the Department of Agriculture. Reports of

such vaccinations shall be made to the Department on forms it furnishes for the purpose. The herd history, to be complete, must show an agglutination test of the entire herd, and in the case of purebreds, the name and registration number must be included. The regulations provide for the removal of positive reactors by permit only, for ear-tagging and retagging, tattooing, and other methods of identification. Provisions are made for the disposal of calves vaccinated at 4 to 8 months of age, for animals sold for immediate slaughter, and for transfer of infected animals to other herds under quarantine restrictions.

Sheep.—All sheep known to have scabies or exposed to scabies mites must be dipped under directions set down by the Department of Agriculture. Quarantine of the sheep is the penalty for failure to comply. The requirement is two dippings in lime and sulfur solution at 95 to 105 F., ten days apart.

Indiana

Personal.—Dr. G. D. Haimbaugh, Rochester, is recovering from an accident which he had on an icy road Jan. 29, 1943, in which his car was demolished and he sustained a skull fracture and several broken bones. Dr. Haimbaugh was enroute to a call when the accident occurred.

Iowa

East Central Iowa Veterinary Medical Association.—The regular meeting of the East Central Iowa Veterinary Medical Association was held at the Montrose Hotel, Cedar Rapids, April 8, 1943, with forty-two members from 16 counties present. The speakers and their subjects were:

Jas. C. Carey, West Liberty: "Acetonemia in Cattle."

Joe W. Giffie, United States BAI, Cedar Rapids: "Saving the Baby Pigs to Make the Food Production Goals."

John B. Bryant, Mount Vernon, reported on a case of hypoglycemia in baby pigs.

C. C. Franks, chief, Division of Animal Industry, Iowa Department of Agriculture, Des Moines: "Protecting Cattle Against Brucellosis by the Test and Calhhood Vaccination Method."

J. A. Barger, Des Moines, United States BAI: "The Advancement Made in Coöperative Work on Brucellosis in Cattle."

Thomas J. Gilloon, Dyersville: "Bovine Obstetrics Based on the Experience of Thirty-Five Years."

The Association, through its Advisory Committee, called to the attention of the Governor of Iowa the indictment of Lafe Goldman of Clinton for having violated the State Veterinary Practice Act in many counties during the

past year. The Association commended the Iowa Department of Animal Industry and the Attorney General's office for bringing Goldman before the Grand Jury.

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Cedar Valley Veterinary Medical Association.—The regular meeting of the Cedar Valley Veterinary Medical Association was held at Black's Tearoom, Waterloo, April 12, 1943. Fifty-one veterinarians from 16 counties were present. The following program was presented:

George T. Smith, Reinbeck, reported on the reactions of rabbits which were inoculated with pseudorabies virus by J. D. Ray of Omaha, at the April meeting.

V. G. Smith, D.D.S., Tripoli, who practiced in India for nine years, gave an interesting and informative talk on that country.

Guy C. Brown, Hudson: "Phenothiazine in Liquid and Powder Form as an Anthelmintic for Swine."

C. A. Stewart, Tripoli: "Grub Control in Cattle."

C. G. Moore, Toledo: "Use of Sulfathiazole in Treating Pneumonia."

R. E. Elson, Vinton: "Relapses of Calf Pneumonia after Treatment with Sulfathiazole."

L. P. Scott, Waterloo: The Treatment of Colds and Coryza in Poultry with Sulfathiazole."

Massachusetts

State Association.—The Massachusetts Veterinary Medical Association met at the Hotel Vendome, Boston, April 28, 1943. Dinner was served at 6 o'clock, after which the following program was presented.

Dr. Newton C. Browder, Boston City Hospital, Boston: "Burn Cases Treated at Boston City Hospital."

A film in technicolor on "Bovine Surgery" by Dr. E. R. Frank, Kansas State College, Manhattan, Kans., was shown. This film had been listed on previous programs but had failed to arrive in time for showing, until April.

s/ H. W. JAKEMAN, *Secretary.*

Michigan

Michigan led all other states in 1942 in the number of participating communities and awards won in the National Health Honor Roll Contest jointly sponsored by the United States Chamber of Commerce and the American Public Health Association. The awards are based on accomplishments in community health protection services against tuberculosis, venereal and other communicable diseases, maintenance of safeguards for milk, water, and food supplies, general sanitation and sewage disposal, and health educational services.

Missouri

St. Louis District Veterinary Medical Association.—The regular meeting of the St. Louis District Veterinary Medical Association was held at the Roosevelt Hotel, St. Louis, May 7, 1943. Dr. Ashe Lockhart of Kansas City was the speaker and his subject was "New Developments in Veterinary Biologics and Their Proper Use." The following officers were elected at the April meeting: L. E. Bodenweiser, *president*; H. S. Richards, *vice-president*; and W. E. Irwin, *secretary*.

New York

The Veterinary Medical Association of New York County.—A special meeting was called by the president of the Veterinary Medical Association of New York County at which a resolution was read to change the name of the corporation from the Veterinary Medical Association of New York County to the Veterinary Medical Association of New York City, Inc. After a short discussion, Dr. L. W. Goodman moved that the resolution be adopted. The motion was seconded and carried by a unanimous vote. The meeting then adjourned.

s/ C. R. SCHROEDER, *Secretary.*

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The Veterinary Medical Association, Inc. of New York City.—The regular meeting of the Veterinary Medical Association, Inc. of New York City was held in the Hotel New Yorker, May 5, 1943. At the business meeting, a letter of appreciation was read from A. M. Lewis, treasurer, of Dogs for Defense, for the part the association is taking in their program and for the donation by the association of \$102.05. A committee was appointed to act as liaison between the New York City Association and Dogs for Defense.

The following program was presented.

W. W. Dimock, Lexington, Ky., president of the AVMA, delivered an address on the subject, "The Practitioner and Preventive Medicine."

Colonel Sam F. Seeley led a discussion on feeding the dogs in the armed services. He was particularly concerned, not with types of food, but with how and when dogs on active military duty should be fed.

Mr. Brosmer of the Association of Dog Food Industries, discussed the campaign that organization is sponsoring to continue the production of a satisfactory dog food.

s/ C. R. SCHROEDER, *Secretary-treasurer.*

Oregon

State Association.—The quarterly meeting of the Oregon State Veterinary Medical Association was held in the Heathman Hotel, Portland, April 14, 1943. Dr. E. E. Chase, vice-president, presided. A committee was appointed to make arrangements for the annual Pacific Northwest Veterinary Medical Meeting to be held in Portland, Ore., July 5-6, 1943. The members of the committee are: Doctors G. H. Huthman, S. L. Brown, Otto Ruehle, C. H. Seagraves, J. N. Shaw, and E. W. Coon. The following program was presented:

C. F. Milleson, Portland: "Immunization of Dogs for Distemper by the Fromm Method."

S. L. Brown, Portland: "Mastitis."

E. M. Dickinson, Oregon State College, Corvallis: "Poultry Disease Control in Wartime."

A moving picture on Addison's Disease was shown.

s/ O. H. MUTH, *Resident Secretary.*

Washington

Prisoner of Japanese.—Major Donald R. Morgan, V.C., who was reported in May, 1942 as missing in action, is a prisoner of the Japanese government in the Philippines. The



Major Donald R. Morgan, V.C.

message was received from the Adjutant General by his mother, Mrs. R. L. Morgan of Vancouver. Major Morgan was on duty with the Veterinary Corps at the Presidio of San Francisco, and was transferred to duty in the Philippines in March, 1941. He is a graduate of Washington State College (1930), where he re-

ceived his B.S. and D.V.M. He later became State Health Inspector, stationed at Olympia.

Wisconsin

Personal.—Dr. Walter Wisnicky, professor of veterinary science and director of fur research at the University of Wisconsin, has resigned, to become effective May 1, 1943, and has resumed the practice of veterinary medicine at Fond du Lac, Wis. Dr. Wisnicky was director of livestock sanitation in the Wisconsin Department of Agriculture from 1930 to July, 1938, at which time he assumed the chair at the University of Wisconsin. His associates and collaborators at the University feel a distinct loss in his resigning from the faculty. Their best wishes go with him. A testimonial luncheon was given in his honor at the Memorial Union by the Division of Veterinary Science, attended by all members. Dr. James S. Healy of the United States Bureau of Animal Industry spoke in appreciation of Dr. Wisnicky, and a gift was presented to him from the members of the department.

s/ JAMES S. HEALY

COMING MEETINGS

American Veterinary Medical Association. Hotel Jefferson, St. Louis, Mo., Aug. 25-26, 1943. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago, Ill., executive secretary.

Chicago Veterinary Medical Association. Annual banquet and meeting, Palmer House, June 8, 1943. F. A. Anderson, 155 W. Grand Ave., Chicago, Ill., secretary.

Oklahoma Veterinary Medical Association. Annual summer meeting, Oklahoma A. and M. College, Stillwater, Okla., June 13-14, 1943. F. Y. S. Moore, McAlester, Okla., secretary-treasurer.

Michigan State Veterinary Medical Association. Michigan State College, East Lansing, Mich., June 23-24, 1943. B. J. Killham, Department of Animal Pathology, M.S.C., East Lansing, Mich., secretary.

North Carolina State Veterinary Medical Association. Forty-second annual meeting, Hotel Carolina, Raleigh, N. Car., June 23-24, 1943. J. H. Brown, Tarboro, N. Car., secretary-treasurer.

Nutrition Conference for Veterinarians. Sponsored by Central Soya Company, Sunset Park, Decatur, Ind., July 7, 1943.

New Jersey Veterinary Medical Association. Fifty-ninth annual meeting, Asbury Park, N. J., July 8, 1943. J. R. Porteus, P.O. Box 938, Trenton, N. J., secretary.

Missouri Veterinary Medical Association. Business meeting only, New Hotel Jefferson, St. Louis, Mo., 8 p. m., Aug. 24, 1943. J. L. Wells, 1817 Holmes St., Kansas City, Mo., secretary-treasurer.

National Veterinary Practitioners Association. Annual meeting, Jefferson Hotel, St. Louis, Mo. Evening meeting, Aug. 26; day meeting, Aug. 27, 1943. J. C. Flynn, 3026 Main St., Kansas City, Mo., secretary.

Eastern Iowa Veterinary Medical Association. Hotel Montrose, Cedar Rapids. Oct. 12-13, 1943. R. E. Elson, Vinton, Iowa, secretary.

American Public Health Association (1790 Broadway, New York City). Wartime Public Health Conference, New York City, Oct. 12-14, 1943. Seventy-second annual business meeting of the Association will be held in connection.

Pennsylvania State Veterinary Medical Association. Penn Harris Hotel, Harrisburg, Pa., Oct. 21-22, 1943. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia, Pa., secretary.

Meetings Postponed or Cancelled

Houston Veterinary Medical Association, Archie Stallings, 801 Waugh Drive, Houston, Texas, secretary. Meetings for the Houston Association have been postponed for the duration.

Mississippi Veterinary Medical Association. H. C. Simmons, Brookhaven, Miss., secretary-treasurer. The 1943 meeting has been postponed indefinitely.

South Dakota Veterinary Medical Association. J. T. McGilvray, R. R. No. 3, Sioux Falls, S. Dak., secretary-treasurer. Meetings for the South Dakota Association have been postponed for the duration.

Virginia State Veterinary Medical Association. E. P. Johnson, Box 593, Blackburg, Va., secretary. Summer meeting cancelled.

BIRTHS

To Dr. (Corn., '42) and Mrs. Clinton M. Baxter, 803 Lindaraxa Park North, Alhambra, Calif., a daughter, Jean Sue, Mar. 13, 1943.

State Board Examinations

North Carolina—The North Carolina Board of Veterinary Medical Examiners will meet at Hotel Carolina, Raleigh, N. Car., at 10 a. m., June 23, 1943, to examine applicants for license to practice veterinary medicine. P. C. McLain, R. 1, High Point, N. Car., secretary-treasurer.

Florida—The Florida Board of Veterinary Examiners will hold a State Board Examination at the Ponce de Leon Hotel, Miami, Fla., June 21-22, 1943. H. C. Nichols, Ocala, Fla., secretary-treasurer.

Illinois—The Illinois Board of Veterinary Medical Examiners will meet at the Chicago office of the Department of Registration, 600 S. Michigan Ave., July 26-27, 1943. Application should be filed at the office of the Department in Springfield, Ill., by July 6. The fee is \$20.00. Formal application blanks must be obtained and filled out.

Virginia—The Virginia State Board of Veterinary Examiners will meet in Room 201, Municipal Building, Commerce St. and Campbell Ave., Roanoke, Va., July 1, 1943, beginning promptly at 9 a. m. Any further information desired may be obtained from H. H. Adair, Bristol, Va., secretary-treasurer.

DEATHS

L. F. Barrett (C.V.C., '10), 57 years old, Cascade, Iowa, died Mar. 9, 1943. Dr. Barrett was engaged in general practice. He was a member of the Eastern Iowa Association, the Iowa State Association, and the National Practitioners Association, as well as of the AVMA.

Densil C. Bartlett (O.S.U., '30), 35 years old, Mount Vernon, Ohio, died Mar. 27, 1943. Born in Mount Vernon, Dr. Bartlett had established a practice there which included both large and small animals. He was a member of the Veterinary Reserve Corps. He joined the AVMA in 1930.

Fred W. Hansen (K.C.V.C., '17), 48 years old, Saint Paul, Minn., died Apr. 21, 1943. Dr. Hansen had been engaged in a general practice in Pelican Rapids, Minn., before going to Saint Paul. He was a member of the AVMA.

THE VETERINARY PROFESSION AND THE WAR

Army Specialized Training Program

General Information on Professional and Preprofessional Training of Veterinary and Other Medical Students and Procedures for Selection of Personnel

Official announcement was made by the Adjutant General's Office in Memorandum W350-112-43, dated April 29, 1943, of the details for training medical, veterinary, and dental students under the Army Specialized Training Program which has been in the process of formation for several months. The substance of the memorandum follows. Persons who have occasion to make reference to the information should consult an official copy of the memorandum.

1) *General.*—(a) In order to assure the Army the annual loss replacements for medical, dental, and veterinary officers, the Army Specialized Training Division has been directed to train a sufficient number of enlisted men who upon receipt of the appropriate degree in medicine, dentistry, and veterinary medicine may be appointed in the Medical, Dental, or Veterinary Corps, Army of the United States. Such training will include both a preprofessional and a professional phase, and so far as possible will be continuous. To this end, basic military training will not be required of enlisted men of the Enlisted Reserve Corps who are bona fide preprofessional and professional students and who, when called to active duty, are finally selected for premedical or medical training under the Army Specialized Training Program.

b) Enlisted men recommended by Army Specialized Training Program Selection Boards for assignment for such preprofessional or professional training at any level, must be thoroughly qualified as regards fitness and aptitude for subsequent professional training. Their scholastic ability likewise must be such that attrition in both the premedical and medical phases will be held to a minimum.

2) *Professional Students.*—(a) There are now in approved schools of medicine, dentistry, and veterinary medicine approximately 24,000 students who hold commissions in the Medical Administrative Corps, Army of the United

States, or in the Officers' Reserve Corps, and who are on an inactive status for the purpose of completing their professional training with a view to appointment in the Medical, Dental, or Veterinary Corps, Army of the United States. The discharge of these students at their own request from their commissions and their enlistment in the Enlisted Reserve Corps have been authorized. Students so enlisted will be ordered to active duty at the end of the academic period which terminates between April 15 and June 30, 1943. Orders calling such enlisted men to active duty will be issued fifteen days prior to termination of this academic period or June 30, 1943, whichever is applicable.

b) The students referred to above will be invited to submit letters of resignation for the purpose of enlistment in the Enlisted Reserve Corps. Such action will be expedited, and report of the number so enlisted, by institution and by class, made to the Adjutant General by May 15, 1943. Based on such reports, the War Department will issue negotiation directives for contracts for Army Specialized Training Program training in selected schools of medicine, dentistry, and veterinary medicine for the number of enlisted reservists in each school in each class.

c) First and second year advanced course ROTC medical students.—

1) Such students who hold commissions in the Medical Administrative Corps, Army of the United States, or in the Officers' Reserve Corps and who resign their commissions and enlist in the Enlisted Reserve Corps will be called to active duty as prescribed above.

2) Those not in the Enlisted Reserve Corps may be voluntarily inducted for subsequent transfer to the Enlisted Reserve Corps and called to active duty.

d) The commanding general of each service command and of the military district of Washington will issue the necessary orders calling

these enlisted reservists to active duty and assigning them to the AST unit at the college or university in which they are currently matriculated. Processing through reception centers will be accomplished in such a manner as to cause the least disruption of school activities.

c) Medical, dental, and veterinary students in good standing in approved schools of medicine, dentistry, and veterinary medicine, not under Army jurisdiction, if inducted under Selective Service subsequent to June 30, 1943, will be assigned with the least practicable delay to the AST unit at the institution in which currently matriculated. Such students should have in their possession a certificate from the dean of the appropriate professional school that the registrant is a bona fide medical, dental, or veterinary student in good standing in the institution which he is attending. This certificate will be presented to the classification officer at the reception center for assignment as stated above. The commanding general of each service command will issue the necessary instructions to assure such assignment.

3) *Preprofessional Students.*—(a) The total number of college students pursuing approved premedical, predental, and preveterinary courses is greatly in excess of the capacity of approved schools of medicine, dentistry, and veterinary medicine. Premedical, predental, and preveterinary students in the Enlisted Reserve Corps will be called to active duty and assigned to an appropriate Specialized Training and Reassignment unit for classification and reassignment. Such students will have in their possession—

- 1) Certificates from the responsible institution authority that they are premedical, predental, preveterinary students in good standing.
- 2) Transcript of their academic record, and
- 3) In the event they have been accepted for matriculation in an approved school of medicine, dentistry, or veterinary medicine, official letters of acceptance.

b) Enlisted men recommended by Selection Boards at Specialized Training and Reassignment units, for continuation of their preprofessional training or for professional training will at the proper time be assigned to an appropriate Army Specialized Training unit.

c) Those not recommended for such training will be assigned as follows:

- 1) Those who qualify for another phase of training under ASTP will be assigned to an appropriate replacement training center for the completion of the required period of basic military training.
- 2) Those not recommended for any phase of Army Specialized Training will be assigned to an appropriate unit or installa-

tion within the territorial limits of the service command.

d) Premedical and predental students only, not in the Enlisted Reserve Corps, if inducted under Selective Service subsequent to the end of the academic period, which terminates prior to June 30, 1943, or if the academic period continues beyond this date, subsequent to June 30, 1943, reporting at reception centers, will if they attain a score of 115 or better on the army general classification test be transferred to a medical department replacement training center if practicable, or to an appropriate installation within the geographical limits of the service command for basic military training. Such men will be designated as candidates for the Army Specialized Training Program by entering under the "Remarks" section of their soldiers' qualification card, "ASTP Candidate." They will then appear before the Army Specialized Training Program field selection board for selection or rejection for the Army Specialized Training Program. They should have in their possession the credentials described in a above for presentation to the classification officer at the reception center. Enlisted men who have completed the required preprofessional schooling and have been recommended for professional training by the ASTP Selection Board at a STAR unit, but for whom there are no appropriate immediate vacancies in contracting schools of medicine, dentistry, and veterinary medicine, will be assigned to a medical department replacement training center and/or to other service command installations, preferably with the medical department, pending assignment to a suitable unit within described quotas, for professional training.

4) *Classification and Assignment at Specialized Training and Reassignment units.*—(a) To assist Army Specialized Training Program Selection Boards at STAR units and elsewhere in the selection for specialized training and in the determination of the level of such instruction, representatives of each approved school of medicine, dentistry, and veterinary medicine within each service command and the military district of Washington will be appointed as civilian consultants. Full utilization will be made of the experience and advice of such consultants in the definite selection of trainees for preprofessional and professional training. While each ASTP Selection Board has the direct responsibility of making appropriate recommendation in each case, the vital importance of the advice of consultants must be borne in mind, in view of their accumulated experience in the evaluation of college credits and of fitness and of aptitude for the study and the practice of medicine. The final objective of such recommendation is not so much the admission of a student to a school of medicine, dentistry, or veterinary medicine, but rather a

selection of a candidate for the practice of medicine and for a commission in the Medical, Dental, or Veterinary Corps, Army of the United States. The procedures for the selection of enlisted men for assignment for training in medicine, dentistry, and veterinary medicine under the Army Specialized Training Program will be no less thorough and exhaustive than those now in common usage for acceptance for admission to the accredited professional schools throughout the country.

5) *Classification and Assignment in Other ASTP Units.*—War Department instructions will be issued shortly regarding the screening of ASTP trainees who, in the second term of the basic curriculum, request specialized training in medicine, dentistry, and veterinary medicine.

6) Certain enlisted men currently assigned to units and installations are eligible for consideration for final selection for such ASTP training at various academic levels. The restricted number of contracted vacancies in approved schools of medicine, dentistry, and veterinary medicine precludes assignment in the near future, of many who are qualified for pre-professional training in the advanced phase or for professional training.

Animal Disease Situation in Australia

The commissioner of health, at the request of the agricultural council, convened a conference of veterinarians in Canberra, in 1942. The program included:

1) A review designed to keep out exotic diseases.

2) A review of disease control measures to combat exotic and epizootic diseases present in Australia.

3) A review of the adequacy of the veterinary service.

4) Coöperation of all states and commonwealth services.

The Conference recommended the forming of three committees: a) Consultation b) Information, and c) Diagnostic. A personnel was named for each.

The Conference was of the opinion that Australia is not well enough staffed to undertake broad control of bovine contagious pleuropneumonia, tuberculosis, and brucellosis. Little more than to hold the *status quo* was expected. A plea was made for increasing the veterinary staffs throughout the country.—*Excerpt from the Australian Veterinary Journal, June, 1942.*

The Pay of Veterinarians in Public Office

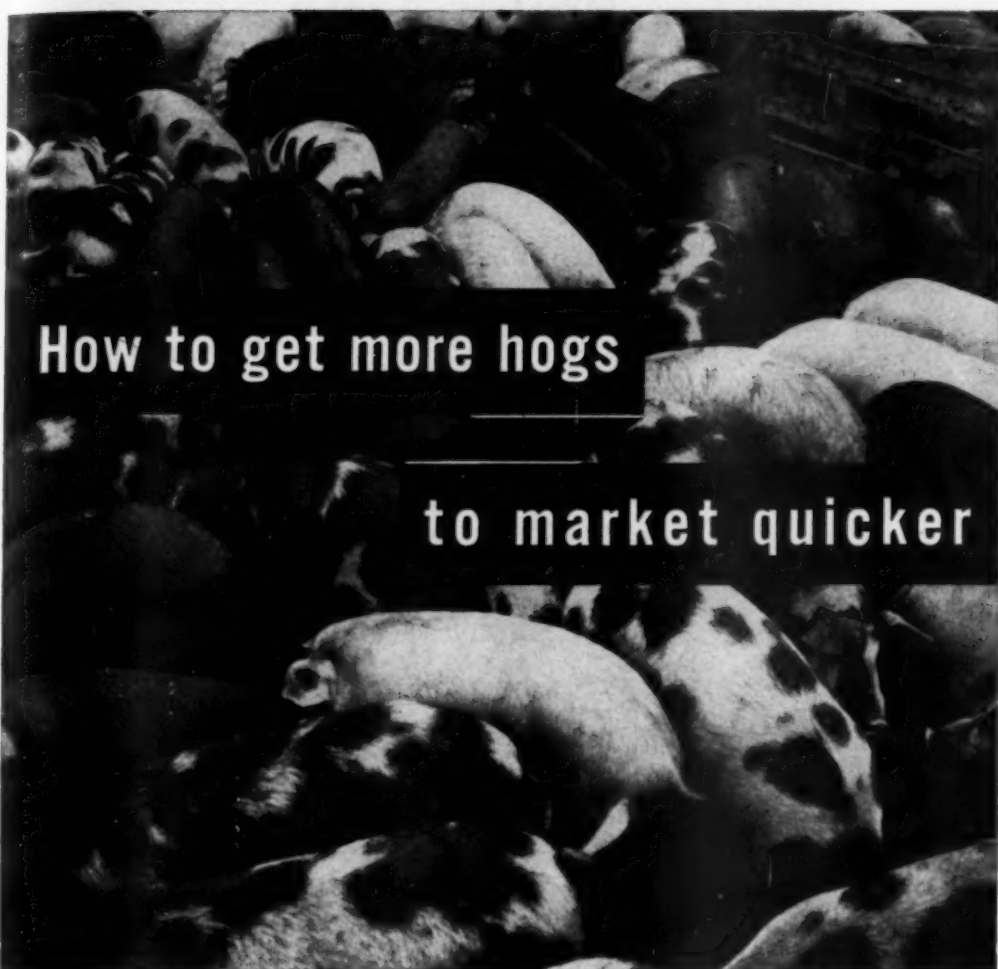
The importance of increased pay for veterinarians occupying public posts is more far-reaching than the personal equation involved. The people's appraisal of the veterinary profession is the main issue at stake. As salaries go, so goes the public's estimate of the service performed. Also, better pay attracts personnel of better than average ambition into the lower ranks, whence come the future key men and executives required to uplift order and efficiency. Veterinary students, whether headed for public office or not, already feel the sting of inferiority *vis à vis* the students of other departments of their alma mater as a consequence of discriminations in salaries. In promotional society work, the low salary onus is too heavy to carry. The veterinarians in the entire public service are so few and the work they do so essential that a few dollars added to their pay would be money well invested. The temporary increase of the pay of Bureau veterinarians, for example, obtained through executive order in December (1942), ends in April. It is, therefore, Duty No. 1 to see that the increase is made permanent.

The Staff of Life

Speaking not of wheat but of oil, Wallace E. Pratt in *Science Digest* for November says "oil is the staff of life." Quoting:

As liquid and gaseous fuels and lubricants, it (oil) moves us over the earth in incredible speed in motor car, airplane, train and ship; it carries our burden in truck, train, and boat; it plows our fields; harvests our crops; smelts our metals from their ores; heats our homes; lights our lamps; cooks our meals and generates electricity for power in mill and factory and mine. Oil is the staff of life.

But, the author goes on to explain that oil became important only when automobiles replaced the horse on land, and ships at sea substituted oil for coal as fuel. These changes were speeded by war. In America oil is practically inexhaustible. The Axis is fighting for it.



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to market quicker

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- 3** A larger percentage of their hogs will reach the market...and at an earlier date.

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An' Related Topics

Katie in Famous Pose



—From *Our Dumb Animals*

Katie, the office cat of the Bullard Company at Bridgeport, Conn., has won nation-wide publicity because everytime a picture of Adolf Hitler is shown to her, she invariably sticks her tongue out at him. Her company was asked to exhibit her at a large cat show in Boston. She arrived in a glass cage and heavily insured. While revelling in her popularity, she had to take time out at the Angell Memorial Hospital to give birth to a male offspring, which resembles Katie in every respect.

Indigestion

In the raising of domestic animals, little things bring big returns. Because of the faith we have in the hypodermic syringe, it's habitual to overlook the benefits of grooming, comfort, restful surroundings, and uninterrupted feeding. Horses, cows, and dogs need grooming to keep a vital integument active and clean and blooming, and what is more beneficial to livestock than eating quietly in lieu of chasing and crowding? The main benefit derived from the self-feeder is eating at leisure, at ease, and un-

disturbed. Money is wasted and effort lost in supplying a balanced ration, scientifically enriched with deficient components, and then sacrificing the benefits to surging and strife and noisy surroundings. The relation between the act of eating and the process of digestion is close and important. Whether this factor is as profound as it is at the dinner table is anyone's guess, but that it is measured by the capable breeder of livestock is incontrovertible.

In the human being, indigestion begins from the day mother forbids Johnny to smack approval of the porridge or the custard pie. Um-m-m, ah, and a hearty smack of the lips or gnawing the drumstick clean may be bad manners in modern life but all these expressions of gustatory pleasure coöperate with the functions of the stomach, the specialists say. The utter misery of conventional table habits, which inhibit and prohibit smacking of the lips, is a mental attitude comparable to disturbed eating in animals. The etiquette of the dinner table, therefore, calls for a lot of bicarbonate of soda.

In animals as in man, eating should fill the stomach and radiate happiness. Otherwise, there's belching, headaches, colics and impactions of the rumen to deal with. That peace of mind prevents these seems to be true, and it doesn't cost much.

What became of Hitler's raucous ravings and Mussolini's protruding chin?

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Cattle, Sheep and Hogs
Used by U. S. Dept. of Agriculture, State Dept's, prominent breeders. Reliable, rust-resistant steel. Lowest prices. Send for circular.

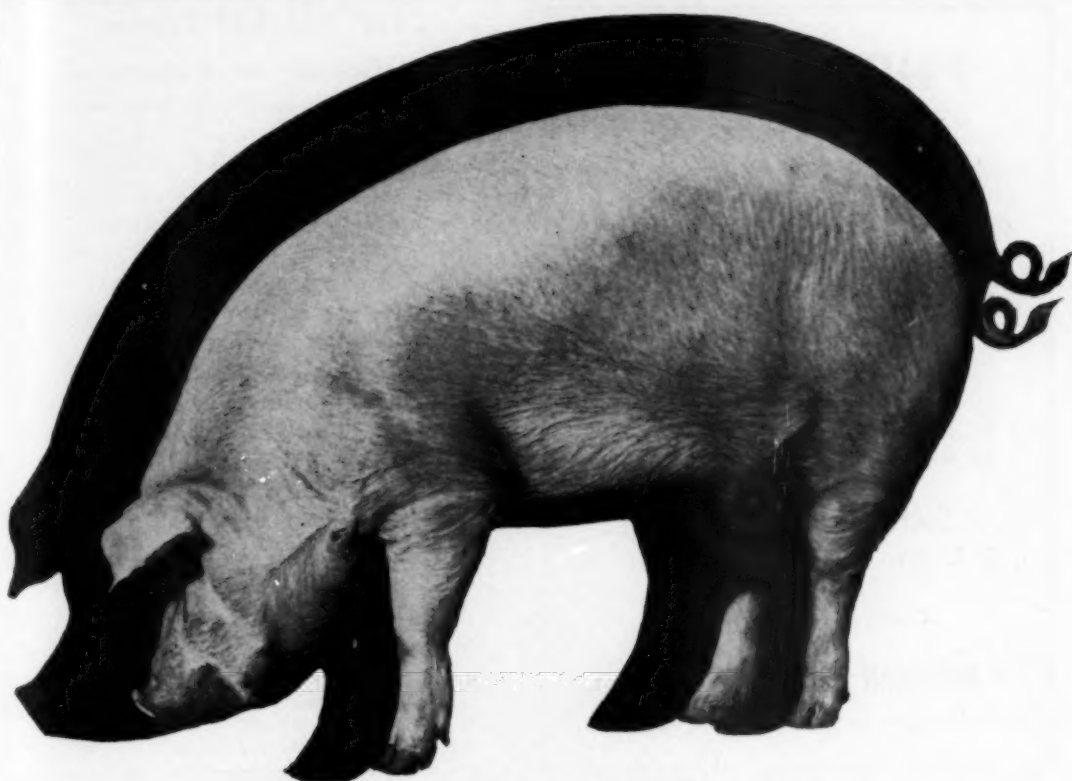


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NATIONAL BAND & TAG CO., Dept. 6-551, Newport, Ky.



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How are your clients going to produce 27% more pork (at less cost in feed, labor and time) and in face of present day hazards? There is an answer:—"Every pound of provender must produce plenty of profitable pork."

1. Your clients must feed home grown grains. These are their cheapest and best feeds. (One ground grain is good; two ground grains mixed together are better; three ground grains mixed together are still better.)
2. Legumes and good pasture must be provided to help cut feeding costs and increase profits.
3. —And, to these cheap home grown grains, legumes and pasture your clients must add the best proteins your local market can provide. (Animal proteins are best; vegetable proteins will have to do where animal proteins are not available.)
4. Your clients will have to feed calcium to build a sturdy frame that will carry the 27% more pork that the above good feeding program should make.
5. Your clients will have to feed phosphorus to build active cells that will help assimilate grains, legumes, pasture and proteins for this 27% more weight.
6. The addition of iodine will be necessary for its activity on the glandular system.
7. Vitamins, also, are absolutely essential for, without vitamins, there cannot be the proper assimilation of calcium and phosphorus. And without proper assimilation of calcium and phosphorus the health and flesh-building value of grains, legumes, pasture and proteins is retarded.

We believe we can help you help your clients in this "27% More Pork Program." Will you send a post card for our "VPC Feed Formula Book" and facts on our "VPC Feed Analysis Service?" These are free to you.

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An' Related Topics

What Is Training for Endurance?

Training a pugilist, sprinter or racehorse is more than removing surplus weight and building up muscular strength. The body must be *trained* to tolerate more than the usual amount of carbon dioxide in the blood without weakening. That power lies in the functions of the respiratory and vasomotor centers which are *trained* to carry on despite the surplus of CO₂ which the lungs can not carry off. According to trainers who study the physiology of their art, the training of these nerve centers accounts for the so-called second wind of the athlete and racehorse. It's an example of functional compensation and is brought about through the gradual stages which characterize careful training. The horse that "wins in the stretch" is the one with a dependable medulla oblongata.

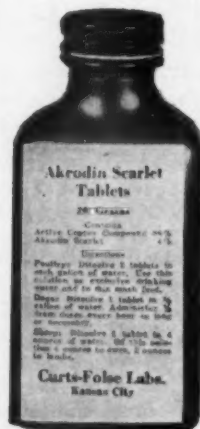
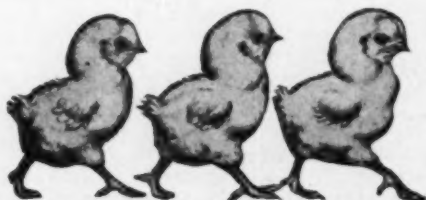
Buying War Bonds shows the soldiers and sailors in action that we folks at home deserve to have them win this bloody war for us.

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1000—Tablets \$4.25
12—1 pounds powder 5.40

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Didn't you hear?



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IMPORTANCE of cattle in America's all-out war effort is being driven home with increasing force. For cattle are prime producers of food for the armed forces, milk for babies, leather for shoes—numerous articles vital to victory. Health and well-being of livestock are paramount if its ultimate value is to be realized.

Veterinarians have found Mixed Bacterin (Bovine) Formula No. 1 an excellent prophylactic against hemorrhagic septicemia complicated by the existence of other organisms producing secondary infections. While single injections are sometimes effective, many prefer three injections at 3 to 5 day intervals.

MIXED BACTERIN (BOVINE) FORMULA No. 1

Supplied in rubber-diaphragm-capped bottles of 50 cc. and 250 cc.

For added information write to Animal Industry Department of



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An' Related Topics

General Foods Takes Over Gaines Dog Food

General Foods Corporation of New York City has announced the acquisition of Gaines Food Co., Inc., with plants at Sherburne, N. Y., and Chicago Heights, Ill., for the manufacture of dog food. The Gaines dog food business was started in 1927 by Clarence F. Gaines whose father had for many years conducted a small but very active feed-milling business in Sherburne. The younger Gaines became interested in the breeding of horses and dogs and his entries of pointers in field trials and bench shows were well known all over the country and have won many awards.

The Gaines Food Company, as a separate division of General Foods, will continue to operate under the management of Mr. Gaines. Its principal products are Gaines Meal, a dog food in meal form, and Gaines "Krunchon," the same food in pellets. The

FASTEST-GROWING BRAND IN THE LAND

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★ When your diagnosis is Milk Fever, use NLC Kalcico for effective medication. This improved, highly efficient formula contains Calcium Gluconate (23%) and Dextrose, fortified with Sodium Iodide, and is indicated in parturient paresis and similar clinical type bovine disorders. ★ Twelve 350-Cc vials, \$7.00, twelve 500-Cc vials, \$8.60. In stock for immediate shipment at NLC branches.



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America's Largest Printers to the Professions
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An' Related Topics

Gaines Company supplied the dog foods used by Admiral Byrd's Antarctic Expedition.

Language and Science

Language is the raiment and working tool of science and the yardstick of its character. But, alas, it is always in need of repair. In ours, perhaps no more than in the allied vocations, it is always something to think about and to keep in a state of respectability — likened to diseases, in a state of good health.

Etiologically considered, the genus to which we belong on the zoölogic roll call dotes on jargon, forsaking the teachings of the school ma'am at the grammar school door. So, the small group of language doctors has an uphill pull. They never get much thanks nor fabulous fees. Their patients are always mad and often cantankerous,



Detection of the

TYPHOID-DYSENTERY

Group

BACTO- S S AGAR

a selective medium designed for isolation of fastidious *Shigella* and *Salmonella* strains. The selective action of the medium restrains development of coliform bacteria with minimum restriction of the typhoid-dysentery group.

BACTO-BISMUTH SULFITE AGAR

a highly selective medium for isolation of *Eberthella typhosa*. The unusual selective properties permit inoculation of the medium with large amounts of suspected material.

BACTO-MacCONKEY AGAR

an excellent differential medium for use in conjunction with Bacto- S S Agar and Bacto-Bismuth Sulfite Agar.

BACTO-TETRATHIONATE BROTH BASE

an enrichment medium for isolation of intestinal pathogens. It is an excellent aid in the detection of carriers.

Specify "DIFCO"

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• Soothing, antiseptic 'B.F.I.' powder in the economical one-half pound can is widely used in both small and large animal practice. . . . For treatment of metritis and allied conditions in cattle, this finely milled bismuth-formic-iodide compound may be applied locally by means of gelatin capsules or as a suspension in mineral oil.

. . . 'B.F.I.' has also proved exceptionally effective as an antiseptic dry dressing in small animal surgery—especially following spaying operations—and in the treatment of ear canker, skin abrasions, lacerations and other wounds.

. . . 'B.F.I.' is protective, because of its excellent spreading and clinging power. It is mildly astringent, promoting contraction of surface tissues and suppressing secretions. It is absorbent, yet does not cake or form hard crusts. Finally it is soothing and antiseptic.

'B.F.I.' powder is supplied in the economical, one-half pound tin with dual-purpose top, as well as in sturdy, new ¼- and 1¼-ounce paperboard containers. Veterinary Division, Sharp & Dohme, Philadelphia, Pa.

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PARD
DEHYDRATED

SWIFT'S
DOG FOOD

☆

An' Related Topics

believing they know more than the doctor himself. Here's how Shakespeare sizes them up:

The truth you speak does lack some gentleness;

You rub the sore when you should bring the plaster.

And so it goes, as the clocks tick away the years, the centuries, the eons. The language doctor has many patients, but few ever swallow his potions. It's more fun to toboggan in the Land of Jargon.

Of the biological sciences, psychology is undermost in popularity, the least understood and the most recondite. As a branch of veterinary science *per se* its practical value oscillates around zero.

The successful practitioner is eye-minded, ear-minded, touch-minded, and smell-minded. He senses things as they are and detects a lot of things others do not.

New! Easy-Flowing!

Armastol

(Iodized Hydrocarbon Oil)

for the treatment of
Mastitis

● When infectious bovine mastitis confronts you . . . consider ARMASTOL!

This iodized hydrocarbon oil preparation is available in a new, improved form from the Armour Veterinary Division.

It is easy-flowing, for easy injection. It is relatively non-toxic, and highly penetrative. It provides an effective method of treating the diseased lactating quarter. And its economy is a further advantage, especially where several cases must be treated at one time.



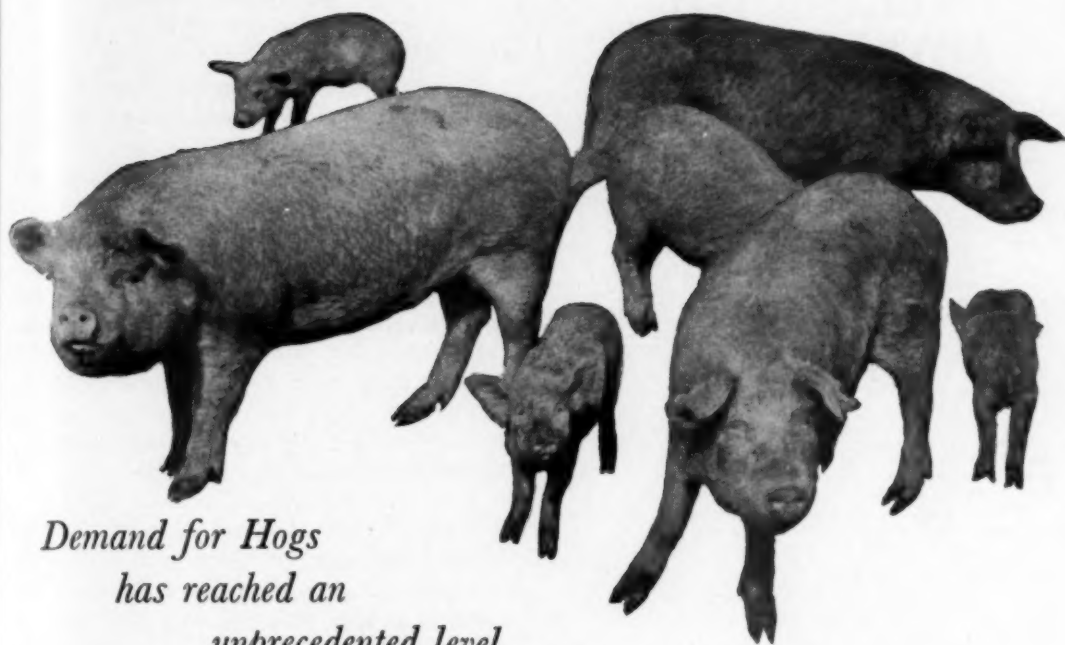
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For full data on Armastol, see page 61 of our new orange Catalog.

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*Demand for Hogs
has reached an
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ANTI-SWINE ERYSIPELAS SERUM AND CULTURE VACCINE *Lederle*

SWINE ERYSIPELAS is a rapidly growing menace to the swine industry, second only to hog cholera.

"Anti-Swine Erysipelas Serum *Lederle*" was the first serum made available to the veterinary profession to combat this disease in the United States.

Lederle Laboratories' production program has been set up to provide sufficient stock to care for the rapidly increased demand resulting from rising hog prices, increased hog population, and the increased disease incidence.

"Erysipelothrix Rhusiopathiae Vaccine *Lederle*" is also available to veterinarians holding permits to administer the product.

PACKAGES:

Anti-Swine Erysipelas Serum *Lederle*
50, 100 and 250 cc. vials

Erysipelothrix Rhusiopathiae Vaccine *Lederle*
15 cc. vial



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Chance of a lifetime. One of Boston's oldest most reputable animal hospitals. Established 38 years. Fully equipped. No investment required. Will lease to responsible veterinarian. Address John Wexler, 47 Johnston Road, Dorchester, Mass.

Veterinarian to operate out-patient clinic in Chicago. Everything furnished. Good hours. Write Dr. W. A. Young, The Anti-Cruelty Society, 157 W. Grand Ave., Chicago, Ill.

Position wanted with a commercial laboratory by Texas A. and M. graduate, '41. Will furnish references and experience. Address "GN", c/o Journal of the AVMA.

Veterinarian assistant for small animal hospital located in Michigan. Excellent opportunity. Give full details regarding experience, age, salary expected, church denomination, etc. Address "PE," c/o Journal of the AVMA.

Ether Cautery complete with points. Dr. R. W. Boyens, 6600 Normal Blvd., Chicago, Ill.

A competent veterinarian, not eligible for the Draft, with knowledge of treatment of large and small animals, to assist in Hospital established in 1905. Opportunity for steady advancement and excellent salary. Address "MC," c/o Journal of the AVMA.

Veterinary student desires to buy instruments, books and equipment of retired or deceased veterinarian. Address "FJ", c/o Journal of the AVMA.

Draft exempt veterinarian to help with practice of small and large animals. Located in New Jersey, 26 miles from New York City. Address "SZ," c/o Journal of the AVMA.

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Eight-room home and dog and cat hospital under same roof. 1942 cash business over \$15,000. Price \$27,000, with \$10,000 cash, balance \$200 per month. Reason for selling, wish to retire. W. C. Bateman, 127 Base Line, San Bernardino, Calif.

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Old, established small animal hospital, completely equipped. 6-room apartment and garage optional. Located at 5449 Broadway, Chicago, Ill. Telephone, Longbeach 3320. Address Mrs. Lucille Frost, Edgewater Hotel, 5452 Broadway, Chicago, Ill.

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WORLD MAP OF DOGS—Unique, Educational: 19" x 24"; \$1.00 each (3 for \$2). Also Chart of All American Breeds, same size, same price. A complete American work on dogs. *Judy's Dog Encyclopedia*, with supplements, \$5. Judy Publishing Co., 3323 Michigan Blvd., Chicago, Ill.

When we go into a veterinarian's office and find the last issue of *American Journal of Veterinary Research* lying opened and read on the doctor's desk, we know the place is run by a veterinarian traveling in the upward direction.

An' Related Topics

Nostalgia

Homesickness, the burning desire to go back home which is listed among the diseases of the soldiers, sailors, WAAC's and WAVE's is the most primeval of the hereditary disorders. When men go to the seashore, go bathing, or build a swimming pool in the back yard, and when boys climb trees, they are homesick hunters for the original fireside—the water and the trees. Science explains that the chain is man to monkey to reptile to fish. Homesickness is, therefore, the expression of an ever-living gene, many million years old. Know any disease that is older?

Because man likes to pounce on things with all the might of his primitive ancestry, baseball and prize fighting are more popular than bridge, billiards, and golf. The fun is in the knockout—the home run or the count. It's brawn, not brain, that attracts the crowd. Who'd sit in the bleachers two hours watching a game of chess?

A man may know little and yet act wisely which is better than knowing a lot and being a fool.



ONE MAN HOLDS HOGS EASILY!

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Save Time Order Direct from this AD *Now*

Short of help — with hogs to ring, vaccinate, castrate, etc.? Here's your answer, now selling in thousands. One end for large hogs, one for pigs. Durable, good for a lifetime. **Send \$1.50 today** — post paid anywhere.

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As an aid in stimulating extensive immunization against potentially dangerous equine encephalomyelitis, we are engaging in a widespread publicity campaign through farm papers and magazines. These advertisements appear from late in March into May. They emphasize the necessity for immunization under war conditions and point out that the work must be done by veterinarians.

The farm papers used for this advertising are:—

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FARM AND RANCH
WESTERN FARM LIFE

—Total Farm Circulation, 2,098,560

We also have available cards suitable for veterinarians to distribute to horse-owners. These are useful in getting the work lined up so that it can be done with the smallest possible amount of lost time. Cards will be furnished free upon request.

Adequate Supplies of our 1943 Encephalomyelitis Vaccine are available. Vaccination Record Books furnished free upon request.

ALL VACCINE IN OUR STOCK IS REALLY FRESH—WE DO NOT PRODUCE VACCINE FROM FROZEN EMBRYO STOCK.

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ENCEPHALOMYELITIS
ranks as a most im-
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Potency-tested "ENCEPHALO" Vaccine

Freshly dated, properly refrigerated stocks now
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WESTERN TYPE

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Available to you without charge upon request:

An Attractive Wall Poster
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Double or Single Mailing Cards
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